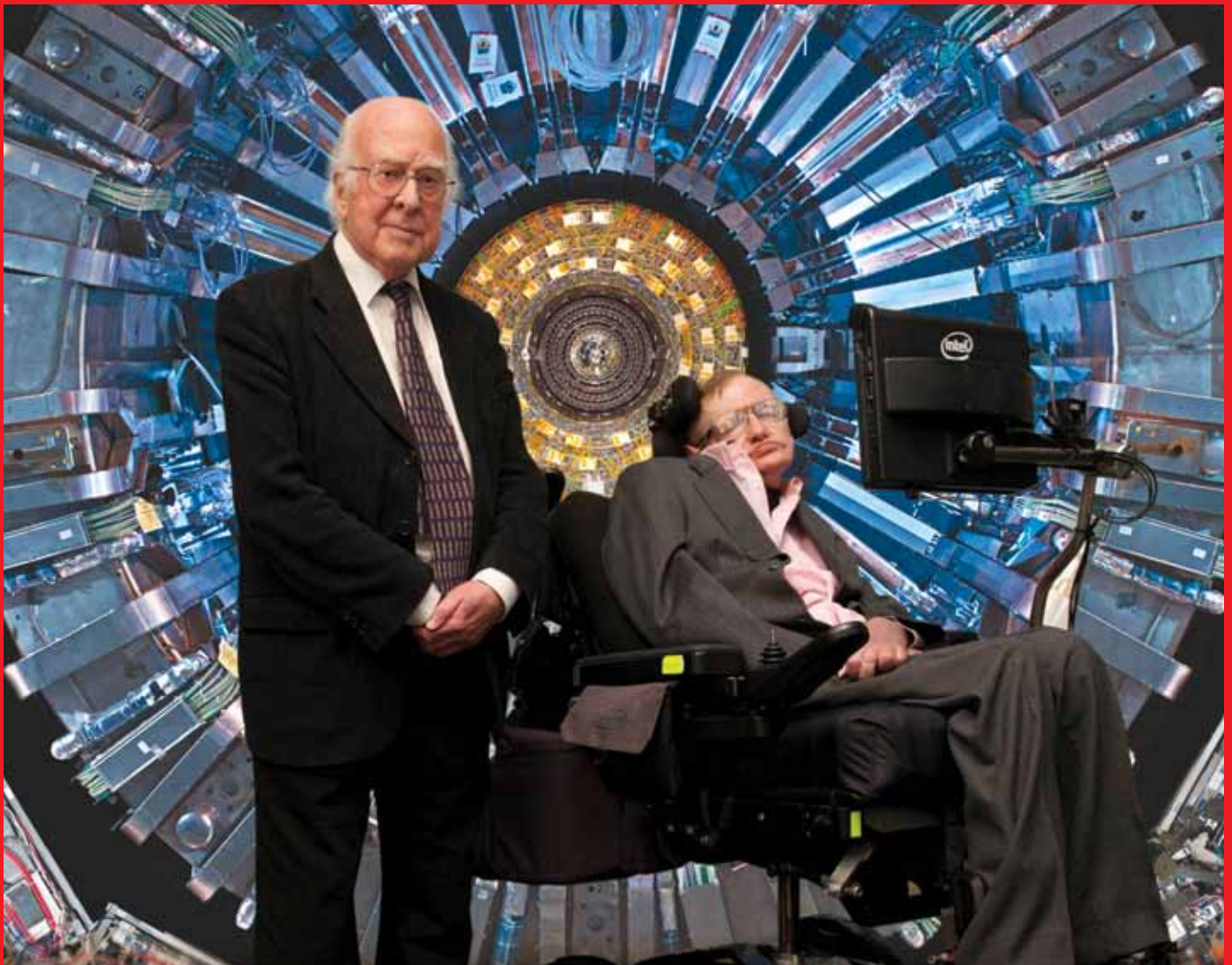


SCIENCE
MUSEUM
GROUP

BIG AMBITIONS SERIOUS SCIENCE

ANNUAL REVIEW 2013–14



CASH BOOST FOR MANCHESTER

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PHYSICS AS PURE THEATRE

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NEW SPACES, NEW STYLES

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STEAM LOCOS BREAK RECORDS

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INFORMAL LEARNING SPECIAL

WHAT WE DO BEST: PAGES 36–43

SCHOLARSHIP CHERISHED ANEW

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SMG INFLUENCE AROUND THE GLOBE 2013–14



One of the key things we are trying to challenge is the idea that science, engineering and design are all part of Britain's great industrial past, not our future

GEORGE OSBORNE CHANCELLOR OF THE EXCHEQUER

SELECTED ENTERPRISES ACTIVITY

Canada
France
Germany
Ireland

Russia
Turkey
Ukraine
USA

OUR COLLECTIONS WERE LOANED TO 30 VENUES IN THESE COUNTRIES

Australia
Belgium
Canada
Denmark
France
Germany
India

Ireland
Japan
Jersey
Netherlands
Norway
Spain
USA

USA AND CANADA

Two Yorkshire-built A4 locomotives were lent to the National Railway Museum from Wisconsin and Montreal for the *Mallard 75* anniversary events

GERMANY AND USA

Eleven international key opinion leaders are on the editorial board for the new SMG online journal, including academics from Stanford and Cornell universities in the USA and the Deutsches Museum in Munich

NEW YORK

SCMG Enterprises launched a strategic partnership with the New York Hall of Science, which included a visit by members of the Events and Retail teams this year

LOS ANGELES

SMG loaned 127 objects to 30 overseas venues including nine National Media Museum objects to *A Royal Passion: Queen Victoria and Photography* at the J Paul Getty Museum, Los Angeles

MEXICO

The Science Museum and the Museum of Science & Industry have been discussing how they might feature in a UK-Mexico year of culture in 2015

BRAZIL

The Science Museum continued to build relationships with key people and organisations in Brazil as part of SMG international strategy

SPAIN

The National Media Museum collaborated with the Museo Nacional d'Art de Catalunya in Barcelona to mount a Joan Fontcuberta retrospective in the Media Space gallery during 2014

MALTA

The Science Museum's Learning team acted as consultants to the Maltese Council for Science and Technology, who are building a National Science Centre near Valletta

SWITZERLAND

CERN collaborated enthusiastically to deliver the *Collider* exhibition at the Science Museum and on its transfer to the Museum of Science & Industry in Manchester

SWEDEN

At the Ecsite (European Network of Science Centres and Museums) conference SMG staff shared best practice with 1000 other museum and science centre professionals

BRUSSELS

Working in partnership with European Union National Institutes for Culture the Science Museum featured 13 biomimetic robots from seven countries in its five-day Robot Safari festival and Lates event

RUSSIA

SMG has established strong relationships with the Russian Federation to develop the forthcoming *Cosmonauts* exhibition, which will be a key component of the UK-Russia Year of Culture. Director Ian Blatchford led negotiations during trips to Moscow

TURKEY

The Science Museum's Mystery Box product continues to enliven educational training programmes run in partnership with Santralistanbul

SOUTH KOREA

The Korea Foundation for the Advancement of Science and Creativity (KOFAC) continued to collaborate with the Science Museum's Learning Department, which hosted a three-month Korean staff placement

JAPAN

Staff from the Corporate Planning Headquarters of West Japan Railway Company visited the National Railway Museum in support of the redevelopment of our sister museum in Japan, the Modern Transportation Museum

CHINA

The *Journeys of Invention* app, featuring 84 unique Science Museum artefacts, launched in December 2013. By February 2014, the app had been downloaded by 230,000 people and 22% of these were in China

HONG KONG

The Hong Kong Science Alive Festival in conjunction with the British Council and the Dongguan Science Museum in China were among many hosts for live science shows by the Science Museum's Outreach team

SIERRA LEONE

A grant from the British Library Endangered Archives programme supported a National Railway Museum initiative to help safeguard archival records relating to the Sierra Leone Railway

INDIA

A research trip to India enabled by the King's Cultural Institute took place to develop a proposal for a Science Museum exhibition on science in India

A MIGHTY BIG BANG FROM YOUR BUCK

Dr Douglas Gurr, Chairman of the Science Museum Group, celebrates another outstanding year of impact, influence and achievement



Four years ago, when I took over as Chairman of this wonderful institution, we set ourselves three challenges: to become financially self-sustaining in what looked like a difficult funding climate, to grow our relevance and audience reach, and to materially improve the quality of everything we do. As I prepare to stand down, let's reflect on how we have done.

On money, the Group has found efficiencies to absorb a 30% real-terms reduction in Government funding whilst continuing to maintain our operations. At the same time, we have raised more than £50 million in new private capital to support key initiatives, created the Science Museum Foundation, which is beginning to build an endowment for the future. In addition, we welcomed the Museum of Science & Industry in Manchester into the Group.

This last year was our busiest ever with more than 5.7 million physical visits, 26.5 million web visits, and

600,000 booked education visits. We welcomed more children on educational visits than any other UK institution by far, placing us well into the top ten most visited families of museums in the world.

On quality, just reflect on a few highlights: *Codebreakers*, the winner of the Great Exhibitions Prize from the British Society for the History of Science; Media Space, which showcases the remarkable National Photography Collection; the reunion of *Mallard* and the A4 locomotives; and *Collider*, which opened to rave reviews and spectacular audiences. Looking forward, later this year we will see *Cosmonauts* and *Information Age*; work begin on a new research centre; and in 2016 two amazing new galleries on maths and medicine.

In short, we have sought to do more with less and we are succeeding. We have made the Group a central player in the science base to inspire the next generation of scientists, mathematicians and engineers who will drive the economy in years to come. We showcase the best of British research for the public and we help them understand its complexities.

All this, of course, is made possible by: a great team led by Ian and encouraged by a strong and committed Board of Trustees; and powerful backing – both financial and otherwise – from you, our cherished friends and supporters.

I hope that you agree that you are indeed getting a mighty big bang from your buck.

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LORD REES
ASTRONOMER ROYAL AND CHAIR OF THE LONGITUDE PRIZE 2014 COMMITTEE



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SMG ANNUAL REVIEW 2013–14

11 The bio-revolution Lates event was a wonderful opportunity to let people see how exciting our institute’s discovery research will be. I’m delighted that so many people came along

SIR PAUL NURSE
DIRECTOR OF THE FRANCIS CRICK INSTITUTE AND PRESIDENT OF THE ROYAL SOCIETY



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OUR FORTE: DOING THE FORMIDABLE

Ian Blatchford, Director and Chief Executive of the Science Museum Group, signals our new ambitions: to reach a more sophisticated adult audience without sacrificing authenticity, and to reinforce the international stature of our Museum collections around the country



“The Science Museum has certainly been a part of my life, as a child and as a parent, and as a government we recognise the importance of investing in science

GEORGE OSBORNE
CHANCELLOR OF THE EXCHEQUER

My scientific colleagues are often alarmed when I tell them that the Science Museum Group must be attuned to the zeitgeist. It may sound like pretentious arty speak, but all I mean is that science and technology provoke a potent mixture of excitement, inspiration, puzzlement and anxiety in all our audiences, and if we stimulate all of these prospects then our work will have greater impact. And there can be few more eloquent testaments to how science, technology and engineering are powerful forces acting on today's culture than the launch of *Collider*, our exhibition about the grandest experiment on the planet.

This has to be the most ambitious special exhibition by any science museum anywhere. From early timid ideas about a small cased display, we soon realised that 'finding the Higgs' was a special cultural as well as scientific event, and that a great museum should respond with appropriate scale and ambition. It was the right response to the zeitgeist.

The challenges of doing so were formidable, both in conveying the epic scale of the experiment and visualising the subatomic world. That experiment is taking place in CERN's Large Hadron Collider near Geneva, where an army of 10,000 scientists and engineers has built and run a particle accelerator the size of London's Circle Line.

Collider's success rests on giving voice to individual scientists and engineers. The Museum was delighted that Peter Higgs, recently the winner of a Nobel Prize, came to speak at its opening and receive an honorary fellowship of the Museum. Peter was so generous with his time, also attending an exhibition launch in parliament, a question-and-answer session for hundreds of eager teenagers, and the most packed press preview I have ever seen. Stephen Hawking, Nima Arkani-Hamed, Rolf-Dieter Heuer and Ian McEwan took part in launch events. And in another sign of the importance of this project, George Osborne – the UK's 'science chancellor' – officially opened the exhibition.

Collider signals several new ambitions for the Group. One is to reach a more sophisticated, adult audience. I have always resisted prevailing pressures to 'dumb down' museum presentation. Now I actively advocate 'dumbing up' and the intellectual debates that followed the *Collider* launch set an admirably high bar. Another wish is to safeguard authenticity when reaching out to visitors, whose numbers have

soared to 3.3 million at the Science Museum. We are also finding new ways for the Group's Museums to work together and the first stop on *Collider's* world tour is the Museum of Science & Industry in Manchester.

Investment in the programme and galleries in Manchester are all part of our cunning plan to move the Group's centre of gravity northwards. Throughout 2013 there was much political debate about the dominance of London in the cultural landscape. The Group has long been ahead in its thinking, because our Museums in Manchester, York, Shildon and Bradford have strong personalities, proud of their regional heritage but of international stature too. They are not mere branches of London. So we were pleased when the Chancellor tweeted about how his children loved our sister museum in Manchester and delighted when the year ended with the Treasury making a large capital grant towards the creation there of a new £3 million exhibition centre. Our ambitions are matched by other key players, and it was tremendous that our excellent partners at the Wellcome Collection worked so hard to bring the *Brains* exhibition to Manchester, where it proved a huge hit.

Across the Group there have been many more extraordinary stories in the past year. On the academic front we have launched our online open-access *SMG Journal* and plans for a

research centre in South Kensington. At the National Railway Museum the reunion of *Mallard* with her sister locomotives from the 1930s generated unprecedented publicity and massive crowds too, notably at Shildon. And the National Media Museum launched *Only in England*, which has been critically acclaimed and marked the first fruits of the Media Space gallery, a long-awaited partnership between our teams in Bradford and London.

All of this ambition needs money, and increasingly that has to come from philanthropy and entrepreneurial flair. I would draw your attention to *page 66* and the article by our Chief Operating Officer, Jonathan Newby, which shows how we are making great progress in our strategy to deliver a sustainable future for the Group by adopting a more businesslike approach.

Finally, I want to thank Doug Gurr for all his support, wise counsel and sheer hard work as Chairman.

Above, SMG directorate visit to the Moscow Science Festival, left to right: Dr Julia Knights (Head and First Secretary, British Embassy Moscow), His Excellency Tim Barrow (UK Ambassador to Russia), Vladimir Dzhanibekov (Cosmonaut and Major General, Russian Air Force), Ian Blatchford (SMG Director), Doug Millard (Deputy Keeper, Science Museum), Tatiana Alekseevna Gevorkyan, Dr Marina Sokolova (Senior Adviser, British Embassy Moscow)

Opposite: the Director greets Chancellor of the Exchequer George Osborne who chose the Science Museum to launch his Your Life initiative, designed to encourage more student involvement in STEM



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Thank you for my entire childhood

AUDIENCE MEMBER TO DAVID ATTENBOROUGH AT IMAX SCREENING OF PENGUINS 3D

- 1 Robin Ince and Brian Cox record Radio 4's *Infinite Monkey Cage* at a Science Museum Lates event
- 2 Jeremy Paxman interviews James Lovelock at the Science Museum for BBC *Newsnight*
- 3 Professor Peter Higgs meets Adam Afriye MP at the *Collider* reception hosted by the Parliamentary Office of Science and Technology
- 4 Director of Learning Dr Alex Burch addresses a Science and Technology Select Committee on climate change at the Science Museum, between Professors Nick Pidgeon and Chris Rapley
- 5 Culture Secretary Sajid Javid meets SMG benefactor Michael G Wilson and Astronomer Royal Lord Martin Rees
- 6 Baroness Lane-Fox, co-founder of Lastminute.com, and Rick Haythornthwaite, Chair of the Web Foundation, visit the Science Museum to unveil the NeXT cube – the original machine on which Sir Tim Berners-Lee designed the World Wide Web
- 7 SMG Director Ian Blatchford with Defra minister Lord de Mauley and Director of the MET Office Phil Evans who co-hosted a round-table debate on agri-tech with the Science Museum
- 8 Lord Martin Rees talks to Shadow Science Minister Liam Byrne at a Science Museum reception
- 9 On a family outing, Professor Stephen Hawking views the new *Mallard* simulator at NRM York
- 10 HRH The Princess Royal visits a Women into Science and Engineering (WISE) awards evening at the Science Museum
- 11 Paul de Quincey (British Council Russia), Ian Blatchford (Director SMG) and Mikhail Shvydkoy (Special Representative of the President of the Russian Federation) unveiling plans for UK-Russia Year of Culture 2014
- 12 Descendants of the Blackett family (owners) and the Hedleys (engineers) attend the 200th anniversary of *Puffing Billy*'s public debut in 1814
- 13 Michael Portillo films *Great British Railway Journeys* at the National Railway Museum, York
- 14 HRH The Prince of Wales opens the refurbished Station Hall, with NRM Director Paul Kirkman

SMG IS THE PLACE TO BE

The UK boasts the world's greatest alliance of science museums in the Science Museum Group. We present a formidable platform for showcasing new ideas to 5.7 million visitors a year. Roger Highfield, Director of External Affairs, says: 'Anybody with an initiative to promote in science and engineering would be foolish to ignore the clout we wield. Look at the calibre of people who come to stage their events at our five Museums, from the parliamentary select committee on climate change meeting in the Science Museum's *Atmosphere* gallery, to Children in Need basing its Yorkshire appeal at Bradford's National Media Museum – not forgetting generous visits by five famous astronauts during the past year.' [More on page 47]



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14

A LURE FOR LONDON'S CULTURE LOVERS

The capital now has a destination space for sharing the world-class National Photography Collection from Bradford

Martin Parr says: 'Tony Ray-Jones's pictures were about England. They had that contrast, that seedy eccentricity, but they showed it in a very subtle way. They have an ambiguity, a visual anarchy. They showed me what was possible.'

What better baptism for a whopping new London gallery of 600 square metres for staging world-class exhibitions? This prestige space is the more surprising for sitting in the Science Museum. With its own licensed café attached. As well as a 300-square-metre Virgin Media Studio for experimental performances. All was made possible by the Principal Founding Sponsor Virgin Media, the collectors Michael and Jane Wilson, and the Dana and Albert R Broccoli Foundation (cue James Bond).

The £4.5 million Media Space was inaugurated with *Only in England*, a double bill of photography by Tony Ray-Jones, adopted mentor to Martin Parr who selected unseen works from 2700 contact sheets in the National Collection and made new prints – and showed his own early work titled *The Non-Conformists*. Everyone from Sir Richard Branson to the Wilsons and Ray-Jones's widow Anna turned up for the launch. The reviews were superb, reminding us that London has long lagged behind Paris and New York in terms of public spaces for photography. Even more



“ We chose Tony Ray-Jones's pictures because they were about England – they have a visual anarchy

MARTIN PARR PHOTOGRAPHER SHOWING AT ONLY IN ENGLAND



encouraging were the 44,000 paying visitors who turned up, 27% of them new to the Museum, almost all being those culture-loving 'engaged adults' every gallery aspires to attract.

Curator Greg Hobson was thrilled to honour Ray-Jones, who died aged only 30 yet influenced successive generations by having departed from the arch styles of 'post-pictorialist' photography prevailing in 1960s Britain. The show ran for six months in London before its tour via the National Media Museum and overseas. Bond producer and SMG cheerleader Michael G Wilson was finally vindicated for his five-year campaign to secure donations and create Media Space with the dual aims of showcasing Bradford's superb collections in London and boosting awareness of other gems in Yorkshire.

Alongside the exhibition, Sir Richard had formally declared the Virgin Media Studio space open and stepped into *1000 Hands*, an interactive audiovisual installation by the design collective Universal Everything, which invited visitor participation through a specially created smartphone app.

Science Museum Director Ian Blatchford concluded: 'Media Space is a huge breakthrough – the gallery's completion unleashes expectations to display more of our collection. It is a point of departure, not of arrival.'

Clockwise: Ian Blatchford, Richard Branson and Michael Wilson at the Media Space launch... The *Universal Everything and You* installation in Virgin Media Studio... People-watchers Sean O'Hagan and Kate Fox discuss English social ritual with Martin Parr in the IMAX... The *Only in England* photography exhibition at Media Space... Anna, widow of Tony Ray-Jones, Martin Parr and curator Greg Hobson tour the exhibition



CASH BOOST FOR MANCHESTER



In March Chancellor George Osborne kick-started fundraising for a new world-class exhibition space at the Museum of Science & Industry, Manchester's leading visitor attraction and site of the world's first inter-city railway station. During Osborne's visit, he announced £800,000 for the Museum and a further £4 million for the University of Manchester, in addition to the National Graphene Institute. He saw the cash boost 'bringing more balanced growth across the UK and building a more resilient economy'.

This spring the transfer of *Collider* from London to Manchester required the exhibition to be adapted to available space. Under the new ten-year Masterplan, the creation of a bespoke gallery in the Grade I listed 1830 Warehouse will accelerate a cutting-edge science exhibition programme and improve capacity. Jean Franczyk, Director of the Museum, commented: 'This financial support by the Government could not be offered at a more important time. Enabling the Museum to host world-class exhibitions will have a huge cultural impact on Manchester and the region.'

The Museum's mission is to explore where science met industry and the modern world began. As the focus of our heritage site, Liverpool Road Station's historical importance is universally recognised. Major interventions are planned on every one of the Station Building's three levels. In practical terms, the Network Rail plan to sever the Museum's mainline access is forcing us to plan fresh ways to maximise our attractions.

Museum Director Jean Franczyk with Government Chief Scientific Adviser Sir Mark Walport, who lectured at the Museum on climate change

Artist's impression of Manchester's planned temporary exhibition space in the 1830 Warehouse

“ This will inspire the next generation of scientists and engineers here in Manchester, bringing more balanced growth across the UK

GEORGE OSBORNE CHANCELLOR OF THE EXCHEQUER



UNEQUALLED AMONG APPS

Here's a privileged step into an astonishing digital realm. Our new iPad app, *Journeys of Invention*, is the first deep narrative from a science museum collection – and making it took as much work as we'd put into a sizable new gallery in terms of research, writing, conservation and photography. Once on board, you explore key ideas in the history of science through 14 interactive stories that are cunningly interlinked. You can study, rotate and even operate 84 of the Science Museum's most iconic objects. Take a 360-degree look inside Apollo 10's command module... examine a flea with Robert Hooke's 17th-century microscope... write messages and encode them with a working model of a Second World War Enigma machine, then share them with friends to decipher.

The app has been called 'a magnificent reputational project'. Andrew Nahum, Senior Keeper at the Science Museum



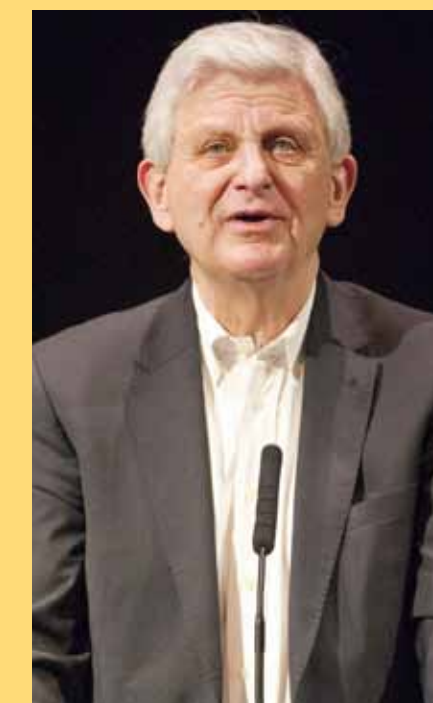
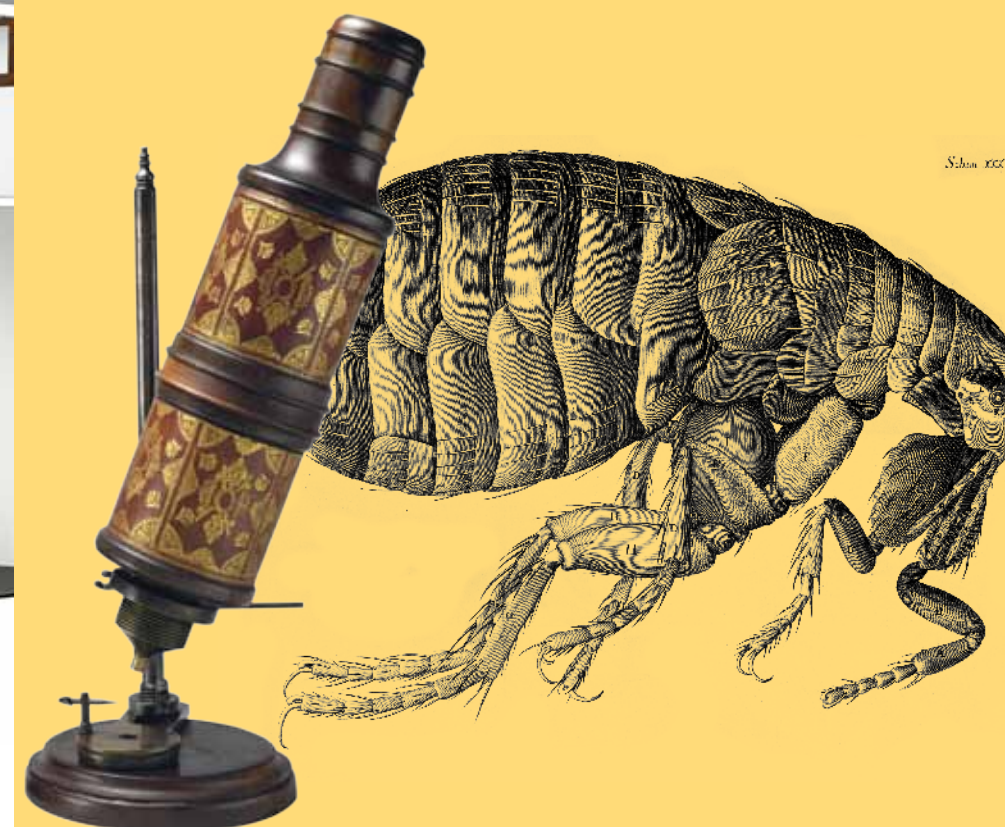
and one of the co-authors of *Journeys*, says it's like having a curator take you on a guided tour of the Museum, only without all the walking. The curated tours run from the 'new science' of the 17th century, through to molecular biology and the new electronics. The multimedia journeys make profuse use of film, images and much seldom-seen art from our own collection.

What's breathtaking is the high-resolution photography which takes you behind the glass of a museum display case and up close. Selina Pang

project managed this, Richard Horton led conservation, Boris Jardine co-authored the stories and the project was developed with award-winning app publisher Touch Press.


The app costs £6.99 – see sciencemuseum.org.uk/journeys

Clockwise: Photographer Nick Mann producing 360-degree images of Science Museum objects for the *Journeys of Invention* app... Andrew Nahum, Principal Curator of Technology and Engineering, launches the app... Illustration of a flea from *Micrographia*, 1665, produced by Robert Hooke by viewing through his compound microscope, formerly in the George III collection

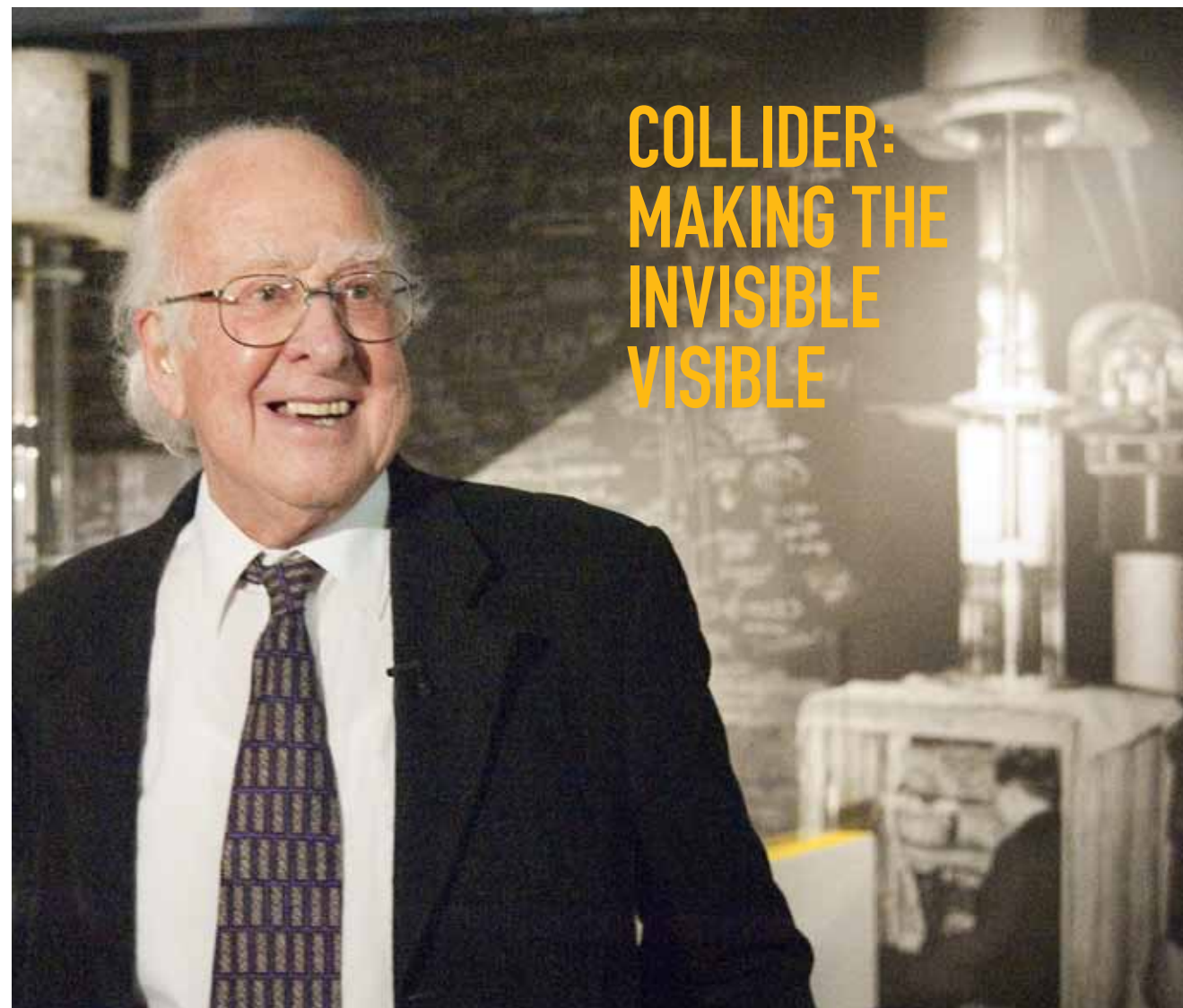


COLLIDER: MAKING THE INVISIBLE VISIBLE

How the Science Museum turned particle physics into pure theatre – and created a new language for staging serious exhibitions

 I particularly like the fresh, theatrical approach the museum is taking to bringing the drama and excitement of cutting-edge science to the public

ROLF-DIETER HEUER CERN DIRECTOR GENERAL



COLLIDER: MAKING THE INVISIBLE VISIBLE

The Science Museum Group is determined to 'dumb up' science – and nothing sums this up better than *Collider*, the ambitious exhibition that aims to take visitors inside the world's largest experiment, the Large Hadron Collider in Switzerland. Director Ian Blatchford wanted this radical exhibition to tackle the staggering endeavour of 10,000 scientists and engineers to build and run the 27 km LHC to explore invisible subatomic worlds and provide new insights into the nature of the universe.

The creative team behind the exhibition was in itself remarkable, including curators Alison Boyle and Harry Cliff (who, at Cambridge University, works on the LHC); lead designer Pippa Nissen; Olivier Award-winning playwright Michael Wynne; and video artist Finn Ross, another Olivier winner.

After visiting CERN (the European Organization for Nuclear Research, where the LHC is based), they quickly realised that the true star of the show was neither the collider's quest to seek the Higgs particle, which is responsible for mass; nor Peter Higgs, who first postulated the existence of the particle in the 1960s; nor the standard model, the theory of all particles and forces (save gravity) which the Higgs would complete. It was the mighty particle-smashing machine itself, with its cathedral-sized detectors and endless supply of superlatives – biggest, hottest, coldest and so on.

The creative team wanted to put the scientists at the heart of the story by blending theatre, science and of course objects from the Museum's collections and from CERN, ranging from magnets to a top engineer's bicycle. In the end



Left: Probing the mysteries of quantum physics at *Collider*: Professor Peter Higgs of boson fame, and The Rt Hon George Osborne MP speaking at the opening

Middle pages: Visitors are immersed in video and sound amid displays of genuine artefacts from the Large Hadron Collider in an environment recognisably simulating CERN itself



“CERN is an extraordinary place and the exhibition team have done a great job of capturing the excitement, awe and wonder of the LHC and physics

PROFESSOR BRIAN COX MANCHESTER UNIVERSITY



This page: The *Collider* project team comprising Ulrika Danielsson, Project Management Support Assistant; Rupert Cole, Content Developer for Exhibitions; Dr Harry Cliff, Fellow of Modern Science; Richard Horton, Conservator of Metals and Engineering; Gemma Levett, Exhibitions Tour Manager; and curator Ali Boyle, Deputy Keeper of Science and Medicine

Launch events, clockwise below: Professor Rolf-Dieter Heuer, Director General of CERN, meets Chancellor George Osborne... Peter Higgs answers questions from young scientists in an hour-long Q&A... Nima Arkani-Hamed, winner of the Fundamental Physics Prize, and novelist Ian McEwan explore the connections between art and science, with broadcaster Martha Kearney hosting... Stephen Hawking gives a moving account of his long life in fundamental physics

54,000 people visited the ticketed exhibition, which was hailed by the *Independent* as being 'better than the real thing' and Radio 4 as 'refreshingly grown up'. *The Economist* added: 'The museum pulled off the even harder trick of depicting CERN's character.'

Sponsored by the Science and Technology Facilities Council and Winton Capital Management, the 'achingly glamorous' high-calibre launch events involved Stephen Hawking, Peter Higgs (fresh from winning his Nobel Prize), theoretician Nima Arkani-Hamed, writer Ian McEwan, broadcaster Martha Kearney and CERN DG Rolf-Dieter Heuer. Chancellor George Osborne and the London Philharmonia added chutzpah. There was also an exclusive reception for Lords and MPs, hosted by the Parliamentary Office of Science and Technology.

Later events saw Lisa Jardine and fellow historian Jon Agar delve into big science, and a special screening of the award-winning documentary film *Particle Fever*, with its director Mark Levinson and star Monica Dunford.

The exhibition's first stop on its UK and international tour is the Museum of Science & Industry in Manchester, where it was launched with the help of broadcaster Richard Bacon, Manchester University physicist Jeff Forshaw and his colleague TV star Professor Brian Cox, who also makes a cameo appearance in *Collider* – fetching the coffee.



WHEN DESIGN PROVES AN INVESTMENT

Attractive spaces inside and out can dramatically enhance a museum visit, so our sites are taking their appearance more seriously

A masterplan sets out a framework from which other great ideas emerge, says Karen Livingstone, SMG Director of Masterplan and Estate. All the Museums in the Group and the storage site at Wroughton have been developing their plans during the past year. We can define our Masterplans against the key themes of the decade to entice diverse new audiences. We can express them through subtle shifts in the programming of contemporary science.

More immediately, though, visible improvements can transform the total visitor experience: new galleries and cafés have arrived at our Museums. Livingstone says: 'Out go dingy dated spaces from another era, and in comes daylight – literally, in the case of the Science Museum's lofty foyer, where for years the massive windows were covered.' Commissioning award-winning furniture for our entrance lobby and installing a wondrous airborne velodrome – and making it visible from the street – amounts to a statement of intent.

'These differences influence people's behaviour, they start to shift perceptions of the organisation,' Livingstone says. 'Making a priority of the quality of architecture and gallery design has been a step change for this Group, whereas it's the norm in most modern galleries. Ben Kelly's designs for the new £4.5 million Media Space and its Virgin Media Studio

specifically integrate a new café with the Science Museum's first significant gallery in a decade, both to showcase contemporary media and announce an international destination.'

Having established our Museums' ambitions, the necessary funds must be raised. In the Science Museum's case a new library and research centre for 2015 are fully funded and RIBA award-winning firms queued up for the contract. Livingstone adds: 'This project places fundamentals such as scholarship and collections at the heart of our Masterplan.'

A second new gallery, *Information Age*, by Universal Design Studios, which opens in autumn 2014, has raised

awareness of many parallel projects for the next five years. The National Railway Museum is re-curating the Great Hall and developing its vast outside space to chime with the city's plans for York Central. In Manchester our six listed structures encourage open-air landscaping of this industrial museum, while also receiving important touring exhibitions such as *Collider*. In Bradford the Media Museum has a menu of radical plans for emphasising its position as a national museum.

'It is our business as museums to keep developing,' Livingstone insists. 'It's a way of staying in control of our destiny, to be driving our own vision and transforming our Museums, rather than reacting to the next financial scenario.'



This page: Ben Kelly's new Media Space café at the Science Museum... The new BFI Mediatheque suite at the National Media Museum where visitors enjoy personal viewing booths

Opposite, clockwise: Emily Pugh's *Bicycle Cloud* of historic velocipedes soars over the entrance hall of the Science Museum... The newly installed Warehouse Café at the Museum of Science & Industry where new glass entrance gates, designed by Peter Saville, frame views of the public realm beyond



“ Good design changes how people behave

KAREN LIVINGSTONE
DIRECTOR OF MASTERPLAN AND ESTATE

BRADFORD AS TIME MACHINE

Huge public support for the National Media Museum has recognised its economic and social impact in Bradford

The National Media Museum celebrated its 30th birthday in its Bradford home with a weekend of activities attended by almost 6000 people, while the annual visit total of 479,000 showed a significant increase among those who visit primarily for our galleries and exhibitions. The Museum is home to 3.5 million items of historical significance, many in unrivalled world-class collections. Traditional and interactive galleries located across eight floors of the Museum investigate and celebrate film, photography,

television, animation and new media. The anniversary aimed to refocus energies on our core expertise. Our 30th Birthday Collection Favourites exhibition reinterpreted key objects from national collections selected by the public, schools and community groups. They included the earliest surviving photographic negative and Lee and Turner's first colour movie footage. A newly designed Mediatheque suite opened to offer on-demand viewing of 2500 titles from the BFI National Collection of Film and TV, the Yorkshire Film Archive and the Museum's TV Heaven collection. The crowd puller in the autumn was *Doctor Who and Me*, an exhibition marking 50 years since the first broadcast, displaying the personal collections of Whovian 'super-fans' plus hands-on events for children and parents to learn how to make electrical circuits.

Twentieth anniversaries were also celebrated by the Bradford International Film Festival (BIFF) and Bradford Animation Festival (BAF). The first featured the work of British director Sally Potter (*Ginger & Rosa*, *Orlando*)

and the scientific films of Charles Urban, while Widescreen Weekend saw Professor Sir Christopher Frayling exploring the aesthetics of Sergio Leone. BAF provided animation masterclasses and screen talks embracing the craft of hit games titles such as *Dishonored* and *Tomb Raider*. The lifetime award for Ian Mackinnon and Peter Saunders was accompanied by filmed congratulations from Tim Burton, who called them 'great artists'.

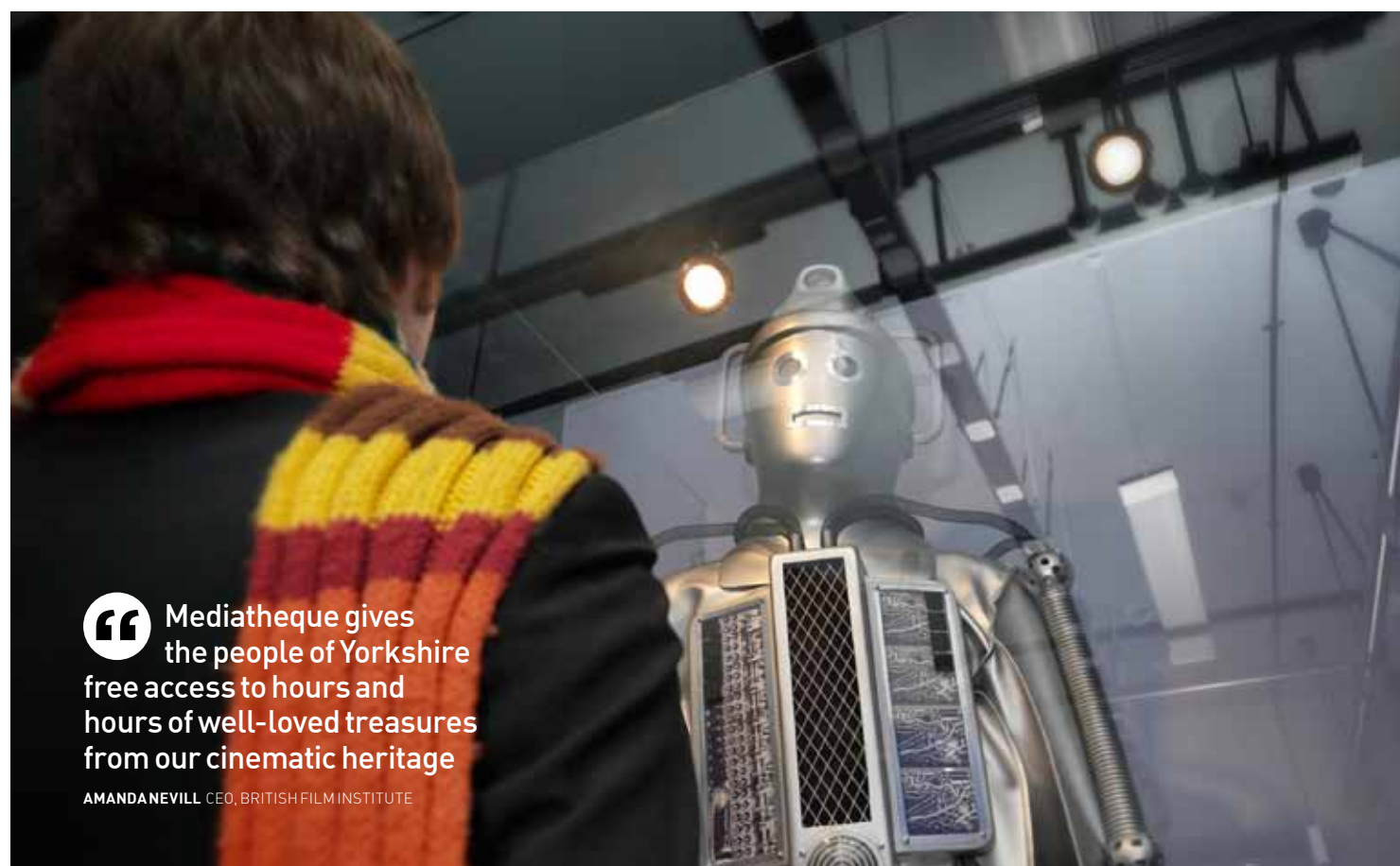
Last year's concerns over the Museum's future have been addressed with a Masterplan to reconfigure the site as a more recognisable national museum. SMG Chief Executive Ian Blatchford says: 'One of the key things we need is a wonderful temporary exhibition space in order to receive high-quality exhibitions generated by the Science Museum and internationally.'

Below: The exhibition *Doctor Who and Me* proved to be the autumn crowd-puller

Main image opposite: Animation team Mackinnon and Saunders receive a lifetime achievement award at the Bradford Animation Festival



Clockwise from here: Director of the National Media Museum Jo Quinton-Tulloch celebrating its 30th birthday... Film critic Mark Kermode on double bass with The Dodge Brothers who presented a new score for the silent classic *Hell's Hinges*... William Fox Talbot's 'Latticed Window in Lacock Abbey, 1835' - the earliest photographic negative - with the camera he used... Actor Brian Cox with his lifetime achievement award at the Film Festival



“Mediatheque gives the people of Yorkshire free access to hours and hours of well-loved treasures from our cinematic heritage

AMANDANEVILL, CEO, BRITISH FILM INSTITUTE



“ The science museum in Manchester makes a huge contribution to the cultural vibrancy of our city and its visitor economy

SIR RICHARD LEESE
LEADER, MANCHESTER CITY COUNCIL

aimed at independent adult audiences.’ A broader strategy to share projects across SMG secured for 2014 the cutting-edge *Collider* exhibition from the Science Museum, and *3D: printing the future* follows. Endorsing the Museum’s importance to contemporary science debate, the Government Chief Scientific Adviser, Sir Mark Walport, chose us to launch his lecture series on climate change and Minister for Energy, Michael Fallon MP, chaired a round-table discussion here with the region’s energy providers.

This year’s vibrant cultural programme showed off the refurbished Station Waiting Rooms adjacent to exhibitions recognising local industry, *Creating the Illusion: Animation in the North-West*, and objects from our own handling collection in *Everyday Relics*. The Manchester Science Festival continues under Siemens’ sponsorship as the Museum’s annual flagship event [see page 51].

A new schools programme launched in January and STEM-related festivals of contemporary science included All Aboard, Made in Manchester, Steam, Sweat and Sewers and the Manchester mini maker faire. The magnificent daily demonstrations of working steam engines and original mill machinery remain at the core of our ongoing public programme.

Clockwise: The world’s oldest passenger railway station and its 1830 Warehouse form the core of the Museum of Science & Industry... A camera from the handling collection on display in the *Everyday Relics* exhibition... Half term at Steam, Sweat and Sewers... The elegantly refurbished station galleries display *Creating the Illusion: Animation in the North-West*... Marius Kwint, curator of the *Brains: The Mind as Matter* exhibition

30 YEARS OF MANCHESTER PROGRESS

Our Museum in Castlefield has begun capitalising on its historic site along with challenging exhibitions

What a way to celebrate our 30th anniversary on the Castlefield site with its six listed structures. Not only has the Museum of Science & Industry triggered a daring ten-year Masterplan to magnify its heritage as home to the Industrial Revolution,

but we were also rewarded with an important injection of Treasury cash to kickstart fundraising for a much-needed new temporary exhibition space. Museum Director Jean Franczyk says: ‘We have become a fundamentally different organisation since joining the SMG and have been on a very fast-paced trajectory to establish our international standing.’

A lively programme of exhibitions boosted total visit numbers to 669,000, first prize going to the Wellcome Collection exhibition *Brains: The Mind as Matter*, which doubled target expectations by attracting 100,000 visits. On transferring from their debut in London, displays were supplemented by half as many more from local collections. Franczyk says: ‘Such a serious-minded exhibition was a departure for the Museum, but Manchester with its many universities has an appetite for high-quality, challenging approaches to science



STAYING ABREAST OF TODAY'S NEWS

Our Contemporary Science team makes its own headlines by mounting live 'meet the scientists' events

The *Antenna* gallery is the home of contemporary science, exploring the latest news in science, technology, medicine, the environment and innovation from every angle. It is the perfect place to position our supporters as thought leaders. Our feature exhibition at the Science Museum – *3D: printing the future* – created a continuing debate by displaying 600 3D printed objects showing the explosion of creativity from 3D printing, cutting through the hype to highlight real innovations. The exhibition included advanced aeroplane and car parts, medical implants and devices.

Breaking news generated media coverage even before the opening and the Contemporary Science team went to great pains to obtain a 3D printed gun to display in the *Antenna* news gallery. Its design was by a non-profit digital organisation and placed, open source, on their website for anyone to download. *Antenna's* online poll asking if we should have access to 3D-print plans for guns divided respondents almost exactly down the middle, suggesting that law-makers face a challenge in ensuring public safety. Among the year's ten news exhibits, a bioMASON brick, grown from bacteria, also prompted visitors to share their views via social media.

Major collaborations included our weekend festival for the Medical Research Council's centenary, where 11 research groups became part of an immersive theatre experience called *The Life Game*. Marking International Women's Day, the Beyond Earth festival hosted talks and workshops with women such as space technologist Marie-Claire Perkinson who develop the latest technology to explore space.

The Robot Safari^{EU} festival in partnership with EUNIC brought together 13 biomimetic robots



To celebrate our 100th birthday the Museum came up with the *Life Game*, an original and brilliant event

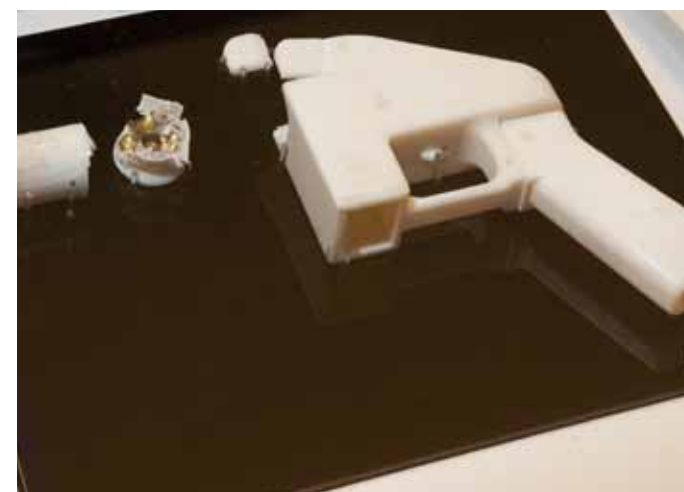
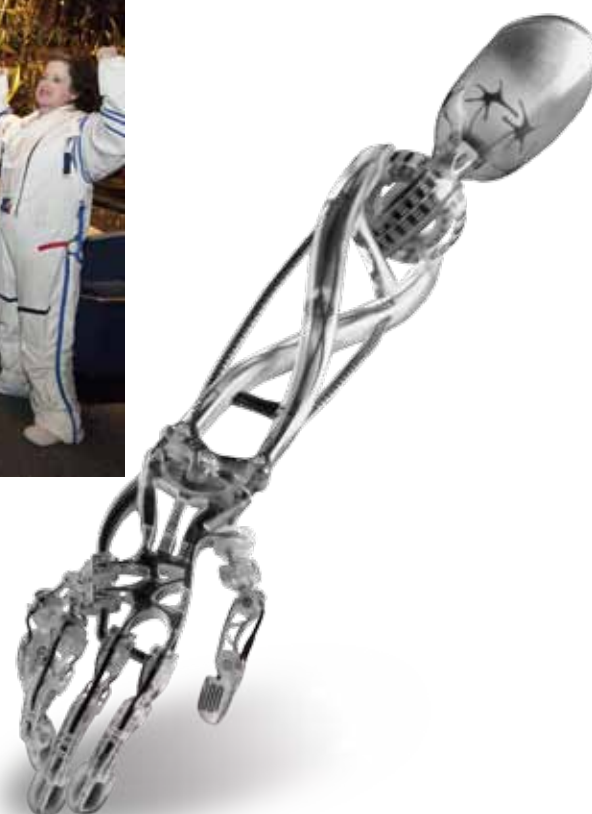
PROFESSOR SIR JOHN SAVILL
CHIEF EXECUTIVE, MEDICAL RESEARCH COUNCIL

from across Europe and drew 6500 visitors. Katrina Nilsson, Head of Contemporary Science, said: 'The robots represented quality research technologies and by curating the festival in a jungle setting [we] demonstrated the impact of contemporary science at its best.'

Her team also provide regular updates in the *Who am I?* gallery and daily *Antenna* science news reports online. Seven 'meet the scientists' *Antenna* Live events attracted 28,000 people in all. In the Live Science programme five groups of researchers came to the Museum to show visitors the process of science at first hand and to use the data collected from visitors to further their research.

The Dana Centre's discussion programme complemented the *3D: printing the future*, *Mind Maps*, *Who am I?* and *Atmosphere* exhibitions and galleries as well as broader issues in contemporary science themes.

From top: Cambridge University Eco Racing team's latest solar racing car at *Antenna* Live... The Swiss-built Pleurobot unveiled its tetrapod motor skills at the Robot Safari... The headline-making 3D printed gun on display in *Antenna's* Innovation Now... Visitors aiding research in the MRC's *Life Game* for adult participants



Clockwise from top: Dana Centre debate First Person Plural: the cult of the photographer and the culture of social media chaired by Steven Bode (off camera) with speakers Adam Broomberg, Julian Stallabrass, Oliver Chanarin, Lucy Kimbell and Nina Wakeford... The HALO unmanned aerial vehicle demonstrated at *Antenna* Live... A 3D printed prosthetic limb... Cosmonaut Svetlana Savitskaya holding a drama event at the Beyond Earth festival... Actress Jenny Agutter collecting her 'mini me' 3D printed figure at *3D: printing the future*

THE GREATEST OF GATHERINGS

Six world-renowned locomotives proved to be record-breaking crowd-pullers to celebrate the 75th anniversary of Mallard's unbeaten world steam speed record



CONTINUED ➔

THE GREATEST OF GATHERINGS



Who could have guessed that six sleek 1930s steam locomotives would break more records than they did in their heyday? The audience pulling power of these glamorously streamlined engines exceeded all expectations, giving the National Railway Museums in Shildon and York their best ever year, with 1.2 million visits.

On 3 July 1938, the *Mallard* A4 Class steam locomotive set a world record by reaching 126 mph. That record still stands and in the past year we celebrated the 75th anniversary of this historic achievement by bringing together at *Mallard's* home in York five surviving sisters: *Union of South Africa*, *Dominion of Canada*, *Bittern*, *Sir Nigel Gresley* and *Dwight D Eisenhower*.

Thanks to the efforts of 70 volunteers during the summer's Great Gathering, 44,000 people saw the footplate of an A4 and had the excellence of its engineering explained. All were built in Doncaster to the design of Sir Nigel Gresley, Chief Mechanical Engineer of the London and North Eastern Railway.



Opposite: HRH The Prince of Wales takes to *Mallard's* cab at York and recalls Queen Mary's saloon from his childhood... Cosmetic restoration of the visiting locomotive 4489 *Dominion of Canada*... Former A4 footplate man John Anthony and wife

Above: Record crowds attend the Great Goodbye at Shildon

For the York Great Gatherings a quarter of a million visitors flocked to the Museum and the tourism body Visit York has credited *Mallard 75* for a city-wide visitor surge.

After some winter touring duties, all six locomotives gathered again in February at Shildon for the Great Goodbye which welcomed 120,000 visitors over nine days. The annual visit numbers for NRM York reached 926,000, up more than 25% on 2012-13 and well ahead of estimates.

The reunions of the six A4s attracted more than 364,000 visits. The commercial turnover during York's Great Gatherings exceeded £1 million, providing a return to the Science Museum Group of nearly £500,000. In addition, visitors to those events generously gave a total of £140,000 in donations plus Gift Aid and the Museum

brought in a further £50,000 with its ticketed photography and dining events. Simon Smalley at NRM Shildon said he had 'never had queues like it' in the gift shop.

The transcontinental move of those mighty machines, *Dwight D Eisenhower* and *Dominion of Canada*, was made possible thanks to £260,000 and £240,000 promised as in-kind support from the Museum's project partners including haulage company Moveright International, shipping company ACL, Peel Ports in the UK and Ceres and Canadian National Railways in Canada.

Project Manager Tobias Lumb and volunteer Tony Oldfield can take much credit for marshalling the star locos and the associated celebrations. Paul Kirkman, Director of the NRM, said that it had been an 'amazing year owing to

the staggering success of the *Mallard 75* series of events of which HRH The Prince of Wales is Patron.'

To cap it all, Prince Charles steamed in aboard *Bittern* to unveil a plaque declaring York's Station Hall officially refurbished, and to be doubly delighted by visiting Queen Mary's saloon, familiar from his childhood. The prince was overheard fondly reliving his memories.

The Mallard speed race was as exciting in 1938 as the Moon race was in 1969. People came to the A4 reunions to admire spectacular engineering

PAUL KIRKMAN DIRECTOR, NATIONAL RAILWAY MUSEUM

LOVELOCK UNLOCKED

Where better to show off the ephemera of the visionary and inventor James Lovelock than the museum that inspired him in the first place? As well as charting a remarkable 70-year career that stretches from colds to burns, via freezing tissues, to the chemistry of atmospheres, both terrestrial and Martian, and even the creation of virtual worlds, the free exhibition – *Unlocking Lovelock: Scientist, Inventor, Maverick* – provides an opportunity to celebrate where he became enthralled with science at the age of six. He says: ‘I learned the science that has kept me busy not by being taught it, but by going to places like the Science Museum.’

The Museum’s big steam engines, push buttons and a description of the use of explosives in mining launched him on an unusual career trajectory, including 40 years working alone in his own lab.

Within 84 boxes of material from Lovelock’s lab, all acquired by the Science Museum in 2012 for £300,000, Alexandra Johnson and her team had everything from his school reports to James Bond-style stories, hand-painted Christmas cards (adorned with worm-like creatures he dubbed ‘Luvles’), notebooks, charts, manuscripts and materials on his 50 or so patents.

Of the 90 items put on show, the most revealing of all is Lovelock’s electron capture detector. This underwhelming-looking device helped to change the face of environmental science by detecting pesticides, CFCs and other key pollutants to show how humankind is changing the planet.

His dawning realisation that ‘pollution was global, not local’ also helped shape his biggest brainwave: Gaia, the idea of Earth as a self-regulating system that maintains favourable conditions for terrestrial life.



Lovelock passionately believes that lone scientists work more like artists and can be more original. ‘I am delighted that the Science Museum has chosen to display this collection – I hope that it will show the next generation how it is possible to do scientific research as a lone inventor and scientist.’

James Lovelock beside his gas chromatograph from 1972 at the exhibition *Unlocking Lovelock*... At right in second image, the repurposed domestic gas flowmeter used to test the accuracy of his measurements... Lovelock family attending the exhibition: daughter Christine, granddaughter Rebecca, daughter Jane Flynn and son Andrew with James’s apparatus designed for a NASA experiment on Mars

A SHOCK OF PSYCHOLOGY IN MIND MAPS

Our world-class medical collections provide a remarkable opportunity to tell stories from the past 250 years of the efforts to reveal the hidden processes of our minds. Divided into four episodes between 1780 and 2014, *Mind Maps: Stories from Psychology* ranges from mesmerism to cognitive behavioural therapy to recent advances in brain scanning. Mental wellbeing is as pressing an issue today as ever before, according to Curator of Psychology Phil Loring, of the British Psychological Society which supported the exhibition.

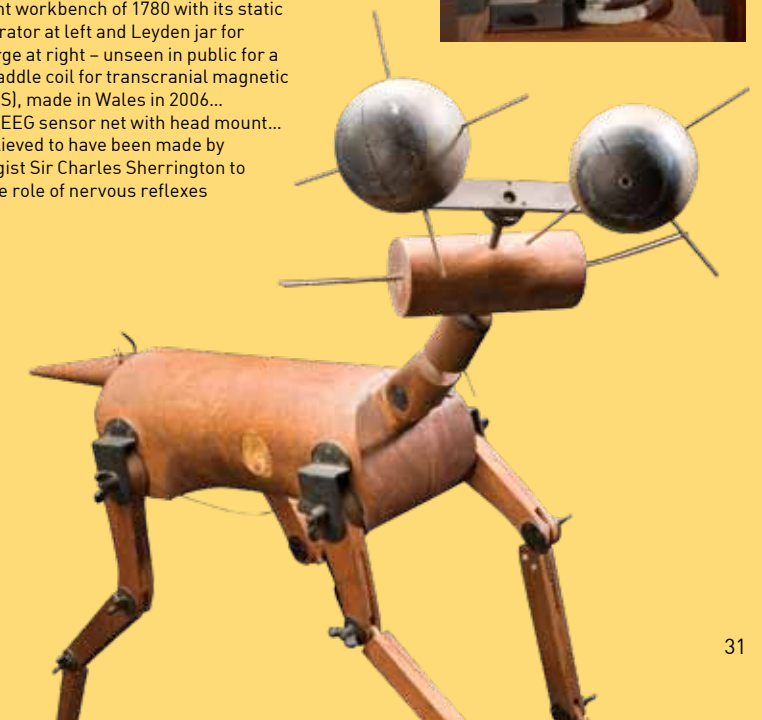
Beyond an opening film by the broadcaster Samira Ahmed, the extraordinary objects in this free exhibition are anchored in the physical: perhaps most dramatic of all is the Italian table where a human nervous system has been dissected and varnished onto its surface.

The pioneering use of electricity in the 1780s to understand nerve activity is exemplified by the elegant table-top workbench of the Italian doctor Luigi Galvani, which has not been on public display for a century, and by a ‘frog pistol’ which made a frog’s leg twitch when fired. We also discover the origins of the word ‘battery’.

Neurologist Charles Sherrington was fascinated by the way cats keep their balance and visitors can see the model that helped the Nobel Prize-winner illustrate their poise. Other more recent items include the first depth recording of brain waves made in the UK in 1958 and a first-generation PET (positron emission tomography) scanner. *The Lancet* said *Mind Maps* ‘documents this rich history brilliantly’.



On show at the *Mind Maps* exhibition: Luigi Galvani’s elegant workbench of 1780 with its static electricity generator at left and Leyden jar for storing the charge at right – unseen in public for a century... The saddle coil for transcranial magnetic stimulation (TMS), made in Wales in 2006... 1980s geodesic EEG sensor net with head mount... Wooden cat, believed to have been made by British neurologist Sir Charles Sherrington to demonstrate the role of nervous reflexes



A FINE CROSS-CULTURAL SMORGASBORD

Exploring artists' perspectives on the past, present and future of science and technology

With the Science Museum's IMAX auditorium now converted to receive live theatre performances, there's seldom a week without music and drama. Most eye-opening for his frank insights was performance artist Mat Fraser in his journey through the history of disability titled *Cabinet of Curiosities*. No less enlightening was *Going Dark*, an astonishing evocation of going



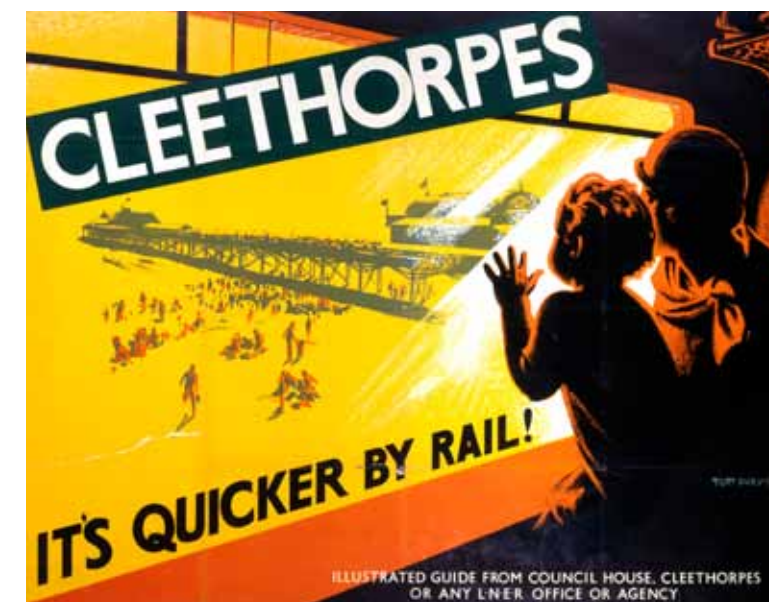
blind, with the audience in a blacked-out studio. Other live performances included *X&Y*, *Centrally Heated Knickers* and *Kraftwerk Uncovered* by the German band Icebreaker, while SMG's new production, *Science Museum Live: The Energy Show*, clocked 34 venues during a nationwide tour.

In the Virgin Media Studio, *Unknown Empires* was a multimedia performance exploring hidden subcultures of dance among older people. Another event there saw Universal Everything 'engaging in romantic explorations of computer code', according to founder Matt Pyke.

Almost 20 years ago, the Science Museum Arts Programme committed us to working with contemporary artists on every major capital project. Alongside commissions for new artworks, Hannah Redler, Head of Media Space and Arts Programme, this year commissioned a new work of fiction, *Shackleton's Man Goes South* by Tony White.

The National Railway Museum mounted several Gallery shows – *It's Quicker By Rail: Speed and Railway Advertising* evoked speed through posters; the photography exhibition *Lines in the Landscape* showed us exactly that; while NRM Shildon hosted *Rail Art 2013* by the Guild of Railway Artists. York's annual event *Locos in a Different Light* invited art students to illuminate the iconic A4 locomotives, and Shildon closed the *Mallard 75* celebrations with a performance of *Steamsong*, a new multimedia opera by John Kefala-Kerr.

The Museum of Science & Industry launched a schools programme with specially devised science shows such as *Forces and Flight*, *Pablo Fanque's Circus of Dreams* and *Inventors Wanted*, all performed in a beautiful new show space, Warehouse for the World. The National Media Museum created interactive science shows, one of which – *Science of Winter* – ran for five days to sell-out audiences. Its photography programme hosted *Copper Horses*, a show of work produced by Chris Harrison as Bradford Fellow in Photography.



Clockwise from top centre: *Steamsong*, a multimedia opera by John Kefala-Kerr at the National Railway Museum, Shildon... *Going Dark*, a drama about blindness at the Science Museum... Victoria Gould and Marcus du Sautoy in his play *X&Y*, performed at our London and Manchester Museums... Poster from 'Quicker by Rail' exhibition at NRM York... The National Media Museum's new live show *Lights! Camera! Action!* ... The multimedia performance *Unknown Empires* in the Virgin Media Studio... Mat Fraser performing his *Cabinet of Curiosities* in the Science Museum IMAX

Far left: A citizen taking part in *Hooked on Music*, a citizen science project at the Museum of Science & Industry

LIVE WIRES CREATING SPARKS

Our Museums inevitably rely on teamwork throughout the 1000-strong workforce. But here's what colleagues have said about this cross section of two dozen live wires – among many more live wires all across the Group

Job titles relate to roles in 2013–14. Some of these talented people have since been promoted



Dave Bentley
SM Workshops Technician
'34 years' service, beautiful craftsmanship'



Toni Booth
NMeM Associate Curator
'Exceeded expectations with *Doctor Who and Me*'



Ben Lheureux,
SM Event Operations Manager
'Always smiling, boundless energy'



Matt Hick
NRM Volunteer Coordinator
'Has set the Group's volunteering agenda'



Jan Hicks MOSI Archives & Information Manager
'Curated a standout *Creating the Illusion* exhibition'



Jon Kaddish
SM Visitor Services Manager
'Makes things tick, knows all about everyone'



Simon Braithwaite
NMeM Collections Information Officer
'Quiet, diligent, classic unsung hero'



Kate Chatfield
MOSI Exhibitions Interpretation Manager
'An eye for detail, introducing change'



Katie Dabin
SM Curator of Medicine
'Her lively curiosity is leading the way'



Selina Pang
SM Project and Production Manager
'Committed to the *Journeys* app'



Pam Porter
NRM Shildon Events Officer
'Excelled during the *Mallard* 75 celebrations'



Tim Procter NRM Curator of Archive & Library Collections
'Organised superb family history conference'



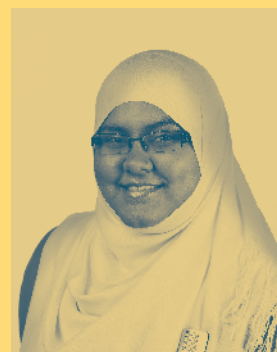
Will Stanley
SM Press Officer
'Dedicated champion for social media'



Sam Fletcher
SM Explainer
'We're trying to recruit more like him'



Jennifer Francis
SM Snr Development Executive
'The go-to person in Development'



Aasiya Hassan
SM Outreach Officer
'Performer, developer, she travels the world'



Cristina Henao SM Snr Visitor Experience Duty Manager
'She's in charge, she knows everything'



Shea Taylor
MOSI Explainer Developer
'Live on stage, an absolute star'



Emma Thom NMeM Snr Web Content Coordinator
'Her social channels reach top-40 web charts'



Will White
NMeM Communications Manager
'Joined during a crisis, stayed on an even keel'



Nick Wyatt
SM Acting Head of Library
'One of those behind-the-scenes leaders'

HOW WE'RE CHANGING YOUR FUTURE

The Science Museum Group's world-renowned Learning team serves up a wondrous mix of fun, ingenuity and inspiration. But nobody should be in doubt about the serious contribution we're making to the nation's future prosperity by enthralling record numbers of young people – nearly 1.8 million in the past year – with the infinite possibilities of a career in science, engineering and technology

Launching his industry-led STEM campaign, titled Your Life, at the Science Museum in May: the Chancellor, George Osborne, was joined by Minister for Women Nicky Morgan (centre) and Education Minister Liz Truss to engage in enthusiastic conversation with students, teachers and entrepreneurs about Britain's need for better maths and physics education. These sectors are, he said, 'essential to our economic security'

SMG LEARNING: ONE WIDE-REACHING TEAM

The Science Museum in London is where the six-year-old James Lovelock was inspired in 1925 to pursue a career that made him the most influential independent scientist and inventor of the 20th century. It is where Bill Gates has hung out with his son. It is where Stephen Hawking says his fascination with physics was fuelled.

The Science Museum is also where the Chancellor, George Osborne, along with three UK ministers, this year launched Your Life, a major campaign to boost the numbers of young people – especially women – studying science, technology, engineering and mathematics (STEM). Of the 1 million children coming through our doors in the past year, a record-breaking 450,000 people visited on educational trips or benefited from the Museum’s outreach programme, more than for any other UK museum.

Highlights of the Museum year included: a Q&A involving Nobel Prize-winner Peter Higgs and 400 sixth-form physics students; 13,000 people watching the explosive science

of *The Energy Show*; a TeachFirst conference aimed at inspiring high-calibre graduates to go into teaching; highly praised ‘Early Bird’ sessions for children with an autistic spectrum disorder; a national teacher training programme aimed at 2000 teachers over five years, part of the Enterprising Science programme, partnering with King’s College, London, and backed by BP; a three-year effort funded by BG Group to raise science literacy in five key London areas; and workshops tailored to teenagers from disadvantaged backgrounds in partnership with the Prince’s Trust, backed by the musician and philanthropist will.i.am.

Our teams’ efforts are built on relationships with schools, families and adults. The informal learning sector is key to the UK’s future economy, though in the past it has been criticised for lacking formal research to gauge its impact. Today, Dr Alex Burch, SMG Director of Learning, says: ‘With our academic research partners at King’s College London and Sheffield Hallam we are now leading the field.’

TRAINING THE SCIENTISTS

Our multidisciplinary SMG Learning and Outreach teams trained up-and-coming climate scientists from Imperial College and University Colleges of Wales to deliver talks about their research; trained more than 120 scientists in public engagement, some from the Royal Society and the Royal College of Pathologists; hosted and contributed to a select committee inquiry into the public understanding of climate change; and worked with overseas partners overseas, notably in Malta and China.

“Without the Science Museum’s support of this TeachFirst event we simply wouldn’t have been able to engage with the new pool of potential STEM teachers

JESSAMY GOULD
TEACHFIRST’S HEAD OF CORPORATE PARTNERSHIPS



Far left: 8th Purley Brownies enjoying an exclusive event at the Science Museum as part of a weekend festival which attracted 6500 Girl Guides

Left to right from top: Workshops held in partnership with the Prince’s Trust... Training the management team of Malta’s first interactive science centre... The Enterprising Science launch at the Science Museum with BP’s Peter Mather, Education Minister Liz Truss, SMG Director Ian Blatchford, computing guru Louis Pouzin and Snr Press Officer Julia Murray... ‘Early Bird’ sessions for children with autistic spectrum disorder... Families taking part in the Cockroach Tour, part of the Building Bridges project family weekend... STEM panel speakers at the TeachFirst seminar: Alexandra Burch, Claudenia Williams, Elizabeth Ebbs-Brewer, Harry Coster, Paul Williams and Simon Singh



SMG LEARNING: SPREADING THE WORD

With museums in London, Manchester, York, Bradford and Shildon, the reach of the Science Museum Group's learning activities is huge. The National Railway Museum in Shildon has launched a new events programme that attracted 28,000 visitors in education groups during the year, while NRM York has helped to explain the science and engineering behind its extraordinary collection with live shows, workshops and more, from tours exploring the rich history of the railways to jaunts in the cabs of famous locomotives.

Almost 40,000 people visited York's National Railway Museum in education groups and the Museum was an enthusiastic participant in National Science and Engineering Week. The Learning team also worked with local children to tell the story of the railways using animations in a partnership led by the National Media Museum, with Bradford Museums and Galleries,

York Castle Museum and Hull Museums Service.

In Bradford, the National Media Museum has devised new educational activities for holidays, such as a Bollywood-themed half-term festival. The Museum's summer blockbuster was *Moving Stories: Children's Books from Page to Screen*, developed in partnership with Seven Stories, the National Centre for Children's Books. Opened in July by *The Gruffalo* illustrator Axel Scheffler, the exhibition explored the art of adapting children's books for film and television.

The Museum has worked with many local partners, such as Bradford Science Festival and notably in a Sorrell Foundation photography project for teenagers inspired by the Museum's collection. In total there were 26,000 visits to the Museum in booked education groups, plus workshops and training events.

FORMING PARTNERSHIPS

The Science Museum's impact extends far beyond London. It has worked in Bristol with *SS Great Britain* in an Arts Council and DfE programme to increase the number of school visits to the ship. An educational app developed in this partnership, *Full Steam Ahead*, has won an industry award. On the three-year Climate Science Outreach Project, in which 3200 children participated, the Museum worked with 83 schools and four partner museums and science centres.

Below: The live show *From Rocket to Bullet* demonstrates physical forces at the National Railway Museum

Right: A Building Bridges workshop explores structures in engineering at NRM... Primary school children in Hong Kong watch the Science Museum outreach team perform the bilingual show *It Takes Guts...* At the National Media Museum Alex Scheffler talks to students about his books in *Moving Stories*



CONTINUED ➔

SMG LEARNING: A HUB FOR NETWORKING

The Museum of Science & Industry in Manchester is a hub for learning in the north. In the past year, the Museum has welcomed 54,000 visitors in education groups, including 37,000 from schools, and has launched a new explainer team and primary schools programme. During National Science and Engineering Week Key Stage 3 students explored cutting-edge digital technologies. The Museum manages STEMNET, the Science, Technology, Engineering and Mathematics Network, for Greater Manchester. We coordinate 1200 STEM Ambassador volunteers across the region, and this year brought networking opportunities to teachers at the Museum's first Raspberry Jam for Raspberry Pi enthusiasts.



Our partnership with MOSI has allowed Siemens to inform the public about the incredible innovations being delivered in our region today

JUERGEN MAIER MD, SIEMENS UK INDUSTRY SECTOR



Clockwise: At the Museum of Science & Industry, *Inventors Wanted* is an interactive storytelling experience... *Pablo Fanque's Circus of Dreams* celebrates a British working-class hero... Our keen new team of Explainers, seen on a helter-skelter at the Museum's Steam, Sweat and Sewers festival



THRILLING YOUNG ADULTS

In the past year 45,000 people attended Lates, the Science Museum's monthly evening for adults only. Most were younger than 35. A record-breaking audience of 7000 turned up to one 'bio-revolution' Lates, organised with the Francis Crick Institute. Sir Paul Nurse, Director, and President of the Royal Society, said he was delighted with what was the Crick's biggest public event to date, where crowds could create and drink a DNA cocktail, knit a blood vessel and meet twins taking part in epigenetics research. The Lates programme also saw Radio 4 recording *The Infinite Monkey Cage* with astrophysicist Neil deGrasse Tyson; and a discussion of the science of cooperation with actress-activist Lily Cole. One dedicated Lates session was organised specially for 1150 Girl Guides.

Participation at our adults-only Lates events: Engineers from CERN engage Lates visitors with objects and stories from the LHC... At the bio-revolution event partnered with the Francis Crick Institute some visitors knit a giant blood vessel while others explore genetics



THE SCIENCE BEHIND GIVING

Our Development team knows how to turn philanthropy into a fine art

Within the Science Museum Group a virtuous circle is now driven by culture, enterprise and philanthropy to boost our profile, extend our influence and help raise funds. Perhaps the pivotal event is the Director's Annual Dinner held in the Science Museum, attended by a dazzling array of talent including Marcus du Sautoy; Anthony Geffen of Atlantic Productions; Daisy Goodwin, television producer; Deborah Bull, Executive Director, King's Cultural Institute; Simon Singh, author; and Astronomer Royal Lord Rees, who in recognition of his many contributions to science was accorded a Fellowship of the Science Museum.

Of course, the Group still depends on Government support for its central role as custodian of 7.3 million objects of historic importance and in helping to inspire and educate the next generation of scientists, engineers and mathematicians. Director Ian Blatchford announced plans for a major maths gallery. Appropriately, the guest



of honour and keynote speaker at the dinner was Cédric Villani, Director of the Institut Henri Poincaré and winner of the most prestigious prize in mathematics, the Fields Medal. His lecture deftly intertwined economics and geometry and he referred to the curse of the mathematician who, as in the legend of the Lady of Shalott, is condemned 'to look at this world only through its reflection'.

In November, Nima Arkani-Hamed joined the launch events around *Collider*, our pioneering exhibition about particle physics, along with luminaries such as Chancellor George Osborne, Russian Deputy Prime Minister for Social Affairs Olga Golodets, Stephen Hawking, Rolf Heuer, Ian McEwan, Dara Ó Briain and the newly minted Nobel laureate Peter Higgs. The glittering range of patrons and supporters included the Science and Technology Facilities Council

(STFC), Winton Capital Management, Embassy of Switzerland, Advanced Oncotherapy, National Instruments and The Ogden Trust.

Another notable opening marked a joint venture between the National Media Museum in Bradford and the Science Museum. Our new £4.5 million gallery, Media Space, was opened by Sir Richard Branson and Michael G Wilson, and supplies of Bollinger celebrated the support of Virgin Media, along with Michael and Jane Wilson, the Wilson Centre for Photography, the Broccoli Foundation and Hyundai.

Unlocking Lovelock, our celebration of the maverick James Lovelock, was supported by Siemens and the Museum's Founders Circle members, Accenture, Barclays and Bayer. Media Space and *Antenna* in London and *Collider*'s transfer to Manchester were supported by People's Postcode



Lottery and the STFC. The Group also met the £16 million target for London's upcoming *Information Age* gallery.

The Development department held 45 events and welcomed 3000 people to the Museum this year. Our great achievements were made possible by our generous financial supporters listed on pages 68–69

Above left: Guest speaker at the 2013 Annual Dinner, French mathematician Cédric Villani

Centre: Gavin Patterson, CEO of BT Group at an *Information Age* cultivation event... Professor John Womersley, CEO of STFC, with Peter Higgs at the *Collider* opening

From top right: Director Ian Blatchford presenting Lord Martin Rees with his Science Museum Fellowship... Sir Richard Branson with Matt Pyke and Matt Tucker of Universal Everything at the Virgin Media Studio opening... Celebrating support from People's Postcode Lottery.

Opposite: Russian Deputy PM Olga Golodets at the *Collider* opening



FOCUS ON THE MEDIA INDUSTRIES

This year the National Media Museum continued to focus on the science and technology of its collections, including new workshops developed during the Bradford Science Festival. The Museum won a 2013 Bradford Council Community Award for Commitment to Family Learning, with STEM activities this year including two new interactive science shows: *Lights! Camera! Action!*, looking at the science of light and photography, and *Reel to Real*, telling the story of the Museum's unique collections of film, photography

and television. A half-term week was given to exploring the technology behind the *Skylanders Swap Force* game, and last summer saw 330 Explainer-led workshops.

In January the Museum hosted the national launch of *Open for Business*, a powerful project funded by Arts Council England to create a contemporary image archive of British manufacturing and industry. The Museum worked with Multistory and the Magnum agency to commission nine world-renowned Magnum photographers to document manufacturing industries in nine British cities including Bradford. Five of the photographers gave education workshops and gallery tours to discuss their techniques. The exhibition is touring to eight other venues, including each SMG Museum.

As part of the city-wide celebration of Indian cinema the Museum mounted the exhibition *Bollywood Icons: 100 Years*

of *Indian Cinema*. Outreach activities examined the impact of Bollywood on newly arrived South Asian communities in Bradford during the 1950s; while a civic reception and on-stage interview with Bollywood star Jackie Shroff were partnered by *Asian Express* newspaper and BBC Asian Network. Shroff dubbed the rise of Bollywood a 'global sensation'.

All at the National Media Museum, clockwise: Celebrating 100 years of Indian cinema with the *Bollywood Icons* exhibition... Half-term insights into the technology behind *Skylanders*... Magnum photographer Jonas Bendiksen talking about his work at the *Open for Business* exhibition

“ As a Government we will do what we can with strategic support but it also requires support from everyone in Bradford

ED VAIZEY CULTURE MINISTER



“ I always try to make time for this incredible museum

MAJOR TIM PEAKE BRITISH ASTRONAUT



In the Science Museum's *Exploring Space* gallery, Science Minister David Willetts meets British astronauts Helen Sharman and Major Tim Peake... Beside the Apollo 10 command module, Chris Hadfield, International Space Station Commander... Doug Millard, Deputy Keeper of Technologies and Engineering, with Gene Cernan, NASA astronaut... Roger Highfield, SMG Director of External Affairs, with Jim Lovell, NASA astronaut and commander of Apollo 13



ASTRONAUTS SPLASH DOWN IN LONDON

The space collections at the Science Museum are an irresistible draw for some of the best-known astronauts on the planet, from the first Briton into space to the last man on the Moon. Gene Cernan, commander of Apollo 17 in December 1972, the last Moon mission, came in to see the Apollo 10 command module, in which he was sent into lunar orbit in May 1969. That was a dry run for the next mission, which put the first men on the Moon's surface.

Later last year, Captain Jim Lovell, the astronaut who led the crew of Apollo 13 to safety after their spacecraft was crippled by an explosion, held an impromptu question-and-answer session for visitors next to Apollo 10.

Safely back on Earth after living aboard the International Space Station, the tweeting and guitar-playing Canadian astronaut Chris Hadfield came to the IMAX to share some of the stories from his new book. And it was in the same venue that the world's media learned that Major Tim Peake had been selected by the European Space Agency as its first official British astronaut. Major Peake delivered his own dose of inspiration to school children gathered specially at the Museum, joining them via an internet video link from Russia to ask for help naming his mission, as part of an ESA competition.

Since the announcement, Major Peake has returned to the Museum to discuss space food with Heston Blumenthal and to launch a competition for schools. Helen Sharman, a regular visitor, has the distinction of being the first Briton to go into space in 1991. On display in the Museum is her spacesuit, which she stood beside as she told leading figures in British drama and theatre about her experiences in the Soviet-era *Mir* space station.

DIGITAL LEAPS FORWARD

The age of connectivity and the web expresses itself throughout the Group

Nothing sums up the increasingly blurred boundaries between the real and the virtual than the dismantling and digitising of the Science Museum's venerable shipping galleries. They make way for the *Information Age* gallery, opening this year. However, more than 1000 ghost ships now live on as a unique point-cloud model created in 3D from 2 billion precise measurements. University College London and ScanLAB Projects collaborated in a first for the UK museums sector by laser-scanning the entire gallery, which yielded a breathtaking fly-through video. Now high-spec data from this digital replica are being made more widely available.

SMG continued to expand its digital audience with our websites receiving 26.5 million visits over the year. A newly developed 'Visit us' section transformed the Science Museum site for almost half our audience using portable devices. And the Great Gathering of *Mallard* and the other A4s gave the NRM's website its busiest day ever on the anniversary of her world record run.

Our increased use of social media, which included Twitter, Facebook and Tumblr, led one independent study to give the National Media Museum and Science Museum second and third places out of 50 national visitor attractions. The Group relied on social media, rather than a media partner, to drive a public vote on the most important innovation from the past 100 years and received a significantly greater response than a comparable poll run by a national TV channel. It proved that discussion between the public and leading scientists, promoted by Twitter, is a phenomenal digital asset.



Huge efforts are being invested to digitise important national collections and the National Media Museum this year gave online access to another 25,000 historic images which include many by Julia Margaret Cameron – one such is shown opposite.

The Group is developing the role of digital apps, our flagship being *Journeys of Invention*, which explores our own unique collections [see page 11]. Within its first two months, 250,000 people – many in China – went on that tour. Another app was *1000 Hands*, which invited the public to populate a Universal Everything multimedia installation in the Science Museum. Online games continue to be popular: the *Axon* game was created for *Brains*, the Wellcome Collection exhibition, and another for *Hooked on Music!* at the Museum of Science & Industry, Manchester, an innovative citizen-science project which investigates the secret of catchy songs, with the University of Amsterdam.

View the shipping galleries video at <http://www.sciencemuseum.org.uk/shipsvideo>



Clockwise: Screen-grab from the stunning video of the shipping galleries scanned in 3D at the Science Museum... One dad's tweet following a family visit to *The Energy Show*... A classic photograph by Julia Margaret Cameron, part of the Royal Photographic Society Collection newly digitised by the National Media Museum... Felix Driver, Professor of Geography at Royal Holloway, and Tim Boon, our Head of Research and Public History, browse the online *Science Museum Group Journal*... Screen-grab of the *Axon* game developed by the Wellcome Collection for its *Brains* exhibition



TLC FOR FAMED TUNING COIL

This magnificent wood, copper and string assembly is the Rugby tuning coil that was test built at Wroughton, the Science Museum's Wiltshire store, before its early installation in the new *Information Age* gallery at the Museum. It is one among hundreds of extraordinary large objects in our collections which demand customised storage conditions and conservation. Those demands can be encapsulated in two recent challenges dealt with by the team, who cleared a storage space for the Tornado jet decanted from the Museum of Science & Industry and disassembled it on site; and conserved a PET scanner for exhibition in the Science Museum's *Mind Maps*.

At NRM York Conservator Stathis Tsolis is especially pleased with a unique new technology called Eyemat – a floor covering being laid in restored railway carriages to protect existing floors from wear by visitors. The vinyl surface carries a photographic image of the original fabric beneath it. Elsewhere at York the Borough Junction signal box has been fully restored.

Among its more curious conservation tasks, our Blythe House team needed to make safe hazardous objects such as a Second World War self detonating fire extinguisher. An unusual Conservation challenge came when the *Collider* exhibition required contractor assistance to cut away a section of casing on a major object loaned from CERN. This enabled visitors to see inside the device for bunching a proton beam. Outdoors at Blythe, last summer saw the first testing of the Denman Horn after painstaking reconstruction of the 27-foot loudspeaker by the Workshops team at the Science Museum, where it went on display in an art installation.



Above: Conservation for the forthcoming *Information Age* gallery at the Science Museum: The aerial tuning inductor from Rugby radio station, 1943–66... an antique telephone



Right: Decommissioned Tornado fighter aircraft arrives for storage at Wroughton... And below, at NRM York, Stathis Tsolis fits the new Eyemat floor covering in the Pullman car, Topaz



Science Festival highlights: Immersive audio at our Manchester Museum's first Lates event, *Dark Matters...* Kylie Minogue, whose lyrics proved scientifically catchy... Visitors try their hand at brain surgery following a dramatic simulation by Professor Roger Kneebone's team... Helen Storey beside her *Eye and I* installation



HOOKED ON CITIZEN SCIENCE

The highlight of the Museum of Science & Industry's cultural programme is the Manchester Science Festival, which in its seventh year consisted of 150 events across the city to inspire all ages, from flash-bang demonstrations to simulated brain surgery.

Hooked on Music, an ambitious Citizen Science project to explore what makes music catchy, launched a programme of festival events, directed by Dr Marieke Navin. It's the largest mass-participation experiment of its kind, launched by a poll and 700 festival goers revealed that 'I Can't Get You Out of My Head' by Kylie Minogue was the catchiest tune of all – a finding that earned a tweet from the pop diva herself.

Actress Lily Cole, TV presenter Carol Vorderman and Science Minister David Willetts were among those who nominated their most memorable tunes. The project was supported by Wellcome Trust Engagement Fellow Dr Erinma Ochu and created with computational musicologist John Ashley Burgoyne and his teams at the Universities of Amsterdam and Utrecht.

Elsewhere in the festival, artist Helen Storey explored the science of emotion, while innovative architecture was showcased in *Ice Lab: New Architecture and Science in Antarctica*, organised by the British Council and curated by The Arts Catalyst.

The festival has received long-term support from Siemens who were 2013's headline sponsor. Major sponsors included Waters Corporation, Electricity North West and the University of Salford. To underline the impact of the festival, it won the 2013 Manchester Tourism Award for best large tourism event.

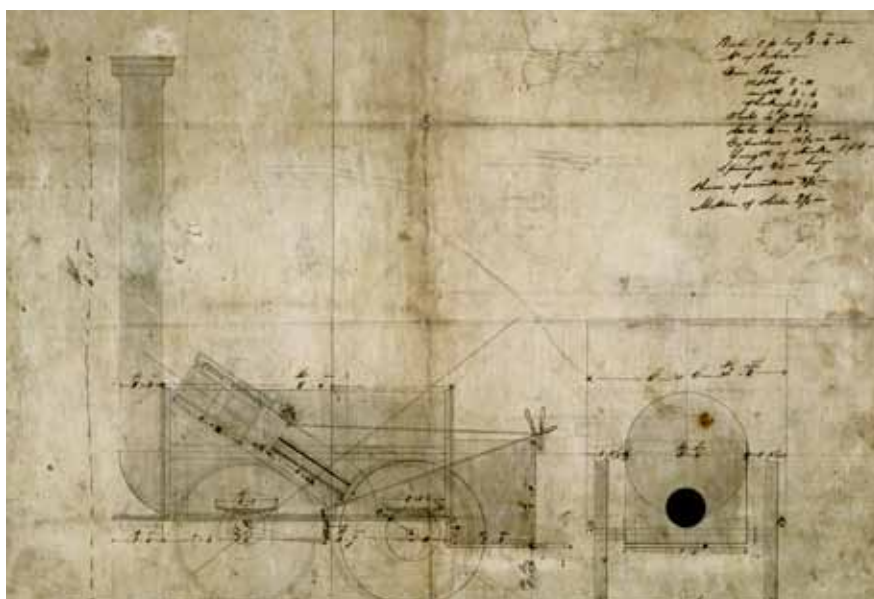
NEW KUDOS FOR OUR SCHOLARS

The Public History Research programme is rebuilding the Group's reputation by cherishing excellence and aligning us with the global academic community

The Group's extraordinary and diverse collection of 7.3 million objects is an open invitation for serious scholarship and, with that in mind, we now publish a peer-reviewed e-journal. Enthusiastically backed by the distinguished historian and Trustee Ludmilla Jordanova, published biannually and edited by Kate Steiner, the *Science Museum Group Journal* publishes research linked with our collections and concerns in the history and communication of science, and its role in museums.

In the spirit of openness that comes with the best scholarship, the content of the digital *Journal* is freely available. Director Ian Blatchford said the *Journal* demonstrates the Group's determination to engage the academic community with our distinguished collections. 'Research is on the rise within the Science Museum Group. At a time when scholarship seems under threat, we are *strengthening* our commitment to a deeper understanding of our world-class collections, conservation challenges and the most successful ways of engaging the wider public with the history of science and the technological and scientific challenges facing modern society.'

The inaugural issue included new research on William Bally's set of phrenological heads by Dr Alice Cliff, Curator of Science and Technology



at the Museum of Science & Industry, Manchester, and on the historical significance of James Watt's workshop by Science Museum curator Ben Russell. At the Yale Center for British Art, Connecticut, Dr Florence Grant took a detailed look at the use of printed books by 18th-century instrument-makers.

As a music history event connecting with Science Museum collections, *Kraftwerk Uncovered* (played by the band Icebreaker) offered insights into the electronic band's contribution to music, alongside talks by David Toop and Richard Witts on music, technology and culture.

The National Railways Museum's research collaboration with the National Archives included a joint conference, *Railways Change Lives*; and a seminar on the history of ambulance trains as a flagship event for the national Explore Your Archives campaign. The NRM's precious Robert Stephenson Archives were awarded United Nations status in the Memory of the World Register as the unique documentary record of how the UK gave railways to the world from 1823. Funds from the British Library

supported our Tracking the Past project to preserve the remaining archives of Sierra Leone's railways, which played a controversial role in the development of that nation.

<http://journal.sciencemuseum.org.uk>

Opposite: Ludmilla Jordanova and Kate Steiner explore the new *Science Museum Group Journal* at its launch... 'Canterbury Locomotion Engine', 1830, part of the National Railway Museum's newly honoured Robert Stephenson Archives... James Watt's workshop displayed at the Science Museum, and the subject of a *Journal* article by Ben Russell

Below: *Kraftwerk Uncovered*, a music history event by Icebreaker... The Sierra Leone endangered archive which the NRM has helped preserve

Your new online *Journal* is a marvellous addition to accessible, well-informed history of science debate

LISA JARDINE
PROFESSOR OF RENAISSANCE STUDIES AT UCL



CONTINUED ➔

NEW KUDOS FOR OUR SCHOLARS

The Science Museum is to create a new research centre at its South Kensington site to provide an international environment for academic research and forge a more intimate connection between the Museum's objects and its library and archive collections. The centre was the logical next step after the establishment of the Research and Public History department, led by Tim Boon, and underlines the long-term commitment on the part of the Group to foster serious research.

The research centre, which replaces the library on the Imperial College London campus, opens in the autumn of 2015 to offer a contemporary and light-filled environment with a quiet reading area, open shelving for printed material and research offices.

The Group's renewed focus on research has already seen the appointment of 16 collaborative doctoral students supported by the AHRC and several funded research projects into the history of science and technology. The study topics are diverse, from the mapping of Africa, to the use of theatrical techniques in museums, to the history of Liverpool Road Station on the architecturally important site of our Museum in Manchester. Many

projects depend on collaborations, such as the National Media Museum's with the Getty Research Institute in Los Angeles, while an Art Fund grant facilitates research into pioneering British colour photography.

Visitors to the research centre will have access to a curated core collection of heavily used academic and popular books and journals. This will be constantly refreshed with material from the Museum's collections in Wroughton. A new digital library management system will give visitors access to the catalogues, the library's e-books, e-journals, databases and web pages as well as to the Museum's collections and image databases and other valuable resources, such as the recently digitised Babbage Archive.

The new centre will also provide a natural home for seminars, such as Return of Biography: Reassessing Life Stories, held at the Science Museum in July 2013 and attended by distinguished figures such as Georgina Ferry, author of *Dorothy Hodgkin: A Life* (1998); Andrew Nahum, Senior Keeper at the Science Museum and author of *Frank Whittle: Invention of the Jet* (2005); and Janet Vertesi of Princeton University, author of a study on the Mars rover exploration missions.



This page from top, doctoral researchers:
Noeme Santana who is studying the Science Museum engineering collection... Thomas Spain, researching food miles at NRM York... Ceri Pitches observing a Key Stage 2 talk about television production at the National Media Museum

Centre: Visualisation by Coffey Architects for the Science Museum's new research centre

Opposite: California's Getty Research Institute continues its analysis of the National Photography Collection at Bradford's National Media Museum... Author Georgina Ferry talking at the Return of Biography seminar



PROWESS OF OUR VOLUNTEERS

A Group-wide strategy has rolled out a Volunteer Managers training course to raise standards of recruitment and to clarify the motives that attract volunteers at different life stages to the many varied tasks our Museums can offer. In these challenging economic times with reductions in our public funding, this support will continue to be critical. Volunteers can choose from supporting discussion events, printing, cataloguing, customer service, cleaning and conservation of vehicles in the collection, opening up locomotive cabs for visitors, running the green-screen photo studio and all kinds of stewarding.



This year, the Science Museum's team swelled to reach 200, with notable growth at Blythe House in the photo studio. In London the typical volunteer may be a student living away from home, juggling the competing social priorities of the young. Contrast this with the National Railway Museum where many of the 440 volunteers at York and Shildon are retired railway personnel who wish to tap into a lifetime of skills and generally have more time to give. Some serve for 20 to 30 years and indeed this year Robert Tibbits, who volunteered at NRM on the day it was opened by Prince Philip in 1975, was awarded the British Empire Medal for his services.

It was an exceptional year for NRM. Over the summer, 100 of its 360-strong team in York provided 5000 hours of support at the *Mallard 75* event. Cab access for 44,000 people was made possible by 70 volunteers during the busiest fortnight in the Museum's history.

The Museum of Science & Industry is delivering the HLF-funded If: Volunteering for Wellbeing, a three-year volunteer training and placement programme which targets socially isolated Manchester residents. The Museum also has 136 volunteers who support key programmes such as conservation, train rides and the



Manchester Science Festival. At the National Media Museum Mandy Tennant manages 56 registered volunteers, involved mainly in either cataloguing important collections, or stewarding at Bradford's film festivals.

York's Volunteer Officer Matthew Hick has provided much insight on this subject and edits the magazine *Volunteer News* on the NRM website. He has placed a value on the Group's 823 volunteers. If they were paid the UK minimum wage, their 95,000 hours' effort would be worth £600,000!



Our volunteers, clockwise from top: NRM veteran Robert Tibbits... Cataloguing in the Gandolfi Room at the National Media Museum... Stephen Wetherill on orientation duty at our Museum in Manchester... Christina Kamposiori in the Collections Information archive and Christian Dollimore as tour guide at the Science Museum

Opposite: Delroy Joseph, who won a London Volunteers in Museums Award, with Sally Munday-Webb, Volunteer Co-ordinator



A NEW DAWN FOR PHOTOGRAPHY

As one of our most significant benefactors, film producer Michael G Wilson has been elected a Science Museum Fellow for tirelessly promoting our superb image collections

Known to the world as a producer of James Bond films, Michael G Wilson is also an impassioned champion of photography as a technology that has brought unique cultural change. He has put SMG Museums in the vanguard of a greater acceptance of the medium among British collectors and curators. Without his energetic fundraising, the new Media Space gallery would not have opened as the London showcase for the National Media Museum. Every Museum in the Group has benefited from his great personal qualities, and for this reason he has been elected a Fellow of the Science Museum.

Along with writing and printing, Wilson regards the earliest photographs as 'revolutionary to human thought



because they changed the way we look at the world'. All the more shocking, he thinks, is the British tradition – since John Ruskin – to dismiss photography as a serious art form. 'Considering Britain is where photography was born in 1839, you'd have thought there'd be keener interest among curators and collectors but there isn't. Until recently the UK has had few spaces offering the necessary conditions to display photographs.'

Yet in the past decade two leading British museums have appointed curators of photography, so what has forced attitudes to change? 'The world and a few people like me harping on at the directors of museums!' he says unabashed. 'Following Tony Ray-Jones, Britain spawned a fantastic group of photographers and some very good dealers. We just don't have very many collectors. We need to build up our community of serious collectors because it takes hundreds to make a difference.'

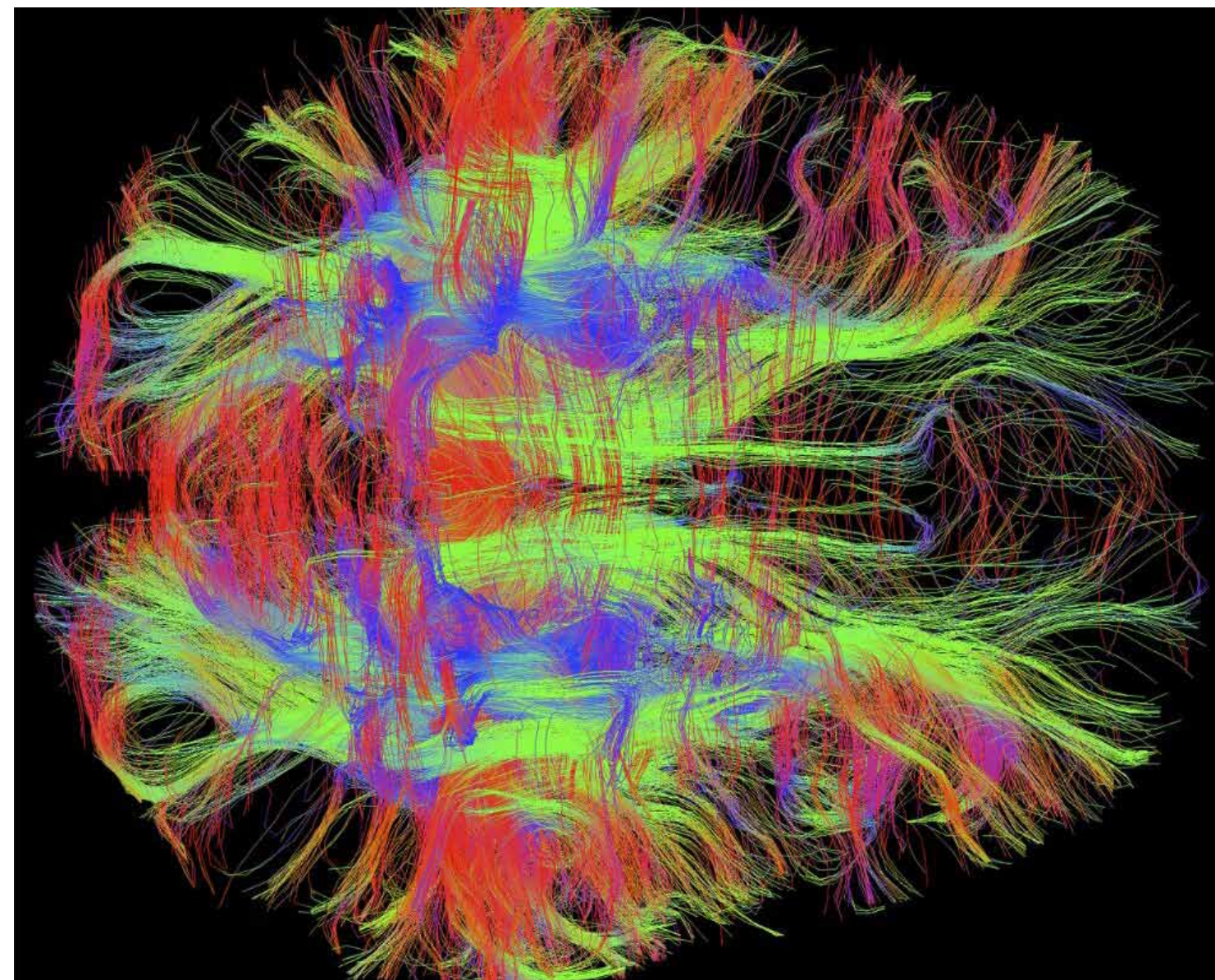
As for enhancing the pioneering collection at Bradford, where acquiring the Royal Photographic Society archive elevated our collection to being one of the most important in the world, Wilson says: 'It is nearly impossible to build a contemporary photography collection without any money. At Bradford we have been acquiring estates and bodies of

work from ageing photographers, giving them royalties and preserving the work. Cultivating collectors and persuading them to donate requires entrepreneurial curators, who are rare in Britain. But things are changing.'

Left: Michael G Wilson, benefactor and newly elected Fellow.

Stars of this year's photographic events across the Group, clockwise from top: 'The Princess Royal and Princess Alice', a 19th-century image by Roger Fenton (Royal Photographic Society Collection)... 'Caught in a Web of Iron' by David Cation from the *Lines in the Landscape* competition at NRM York, sponsored by Network Rail... Magnum photographers David Hurn, Jonas Bendiksen, Mark Power and Stuart Franklin giving a masterclass in the vault at the National Media Museum...

'Nerve fibres in a healthy adult human brain' by Zeynep M Saygin in the exhibition, *Wellcome Image Awards 2014*, partnered with the Museum of Science & Industry... Circular snapshot of market girls commemorating 125th anniversary of the commercial Kodak No 1 camera



ENTERPRISES ARE F-A-B

Serious exhibitions for adult audiences, plus unique family attractions, are generating much-needed revenues

Necessity is indeed the mother of invention: the Group's commercial wing has reported impressive profits to help offset the relentless decline in Government funding. 'This has been the all-time record year for Enterprises,' said Sam Mason, Commercial Director. 'We were £500,000 up on expectations and saw a significant growth in turnover.'

This year the National Railway Museum sites in York and Shildon proved irresistible for 364,000 visitors, drawn to the Great Gathering of beautiful A4 locomotives. Mason said: 'It was free but the 30% rise in visitor numbers led to a huge surge in spending in our shops and restaurants – which we have refurbished across the Group. This was not just a boost for us but the local economies.' Locomotion Models,

which produces limited editions of iconic locomotives, also yielded £100,000 for reinvestment in NRM Shildon. 'Overall, it's a real success story,' said Director Paul Kirkman.

New simulator rides have been rolled out: Stephen Hawking's family enjoyed the new *Mallard* experience in York; in London, unique Typhoon video footage added to our white-knuckle rides; and visitors can play with special effects in the new green-screen photography studio. The IMAX theatre in the Science Museum screened three new 3D films, taking visitors to Mars and beyond. Meanwhile the projectionists have retrained as stage technicians so that the IMAX can receive theatrical productions such as *The Energy Show*.

Two London ventures aimed at independent adults have helped maximise returns. As the Science Museum's first major ticketed exhibitions in years, *Collider* and *Only In England* encouraged Enterprises to start developing high-end adult gifts. Mason said: 'We're also expecting to take £500,000 from the licensed Media Space café. Never underestimate the appetite out there for brain food.'

Reputation by association has put SMG in the UK's top ten venues for corporate event hire and this year's 600 bookings yielded £1 million profit. Our Museums offer two IMAX auditoria for AGMs or,

for formal dinners, the Flight gallery in London, Revolution Manchester, two magnificent halls in York and many other fascinating gallery spaces.

As well as retailing updated souvenir guides, watches and best-selling *Mallard* books, the Group boasts an Inventor in Residence, Mark Champkins, to create new products. He challenged young people to overcome a common summer problem. Sophia Laycock, aged 11, designed the Pediclean to remove seaside sand from your feet and won a MakerBot Desktop 3D printer. You can buy one in our shop for £1700.

The IMAX theatre has seen a resurgence with superior space exploration films but also live stage shows

SAM MASON SMG COMMERCIAL DIRECTOR

Above right: The new licensed server-style Dining Car restaurant in Station Hall at the National Railway Museum, York... Winner of the summer invention competition in the 3D printing exhibition Sophia Laycock pictured with her Pediclean and prize printer... The 00-gauge Deltic in late East Coast livery from Locomotion Models sold 1000 pieces within three weeks of launch

Below: Typhoon display pilot Jamie Norris and Wing Commander Graham Pemberton at Fly Zone, Science Museum... Tom Smith and Paul Williams of the retrained team at the IMAX, Science Museum... The newly refurbished shop at the Museum of Science & Industry, Manchester



LANDMARKS IN INGENUITY

Hadrian Ellory-van Dekker, Head of Collections at the Science Museum, on the tricky task of collecting



We museum curators are constantly aware of our predecessors and, more viscerally, those who will follow and, with the comfortable luxury of hindsight, pass informed judgments on the decisions we made. Building a collection is not easy. Developing

a national collection of international and lasting significance is even more daunting. On the next four pages, we have made a small selection of items added to our collections this year. Great acquisitions are often the result of serendipity as much as informed

judgement. They bear witness to our continued commitment to create the world's foremost assemblage of the material culture of science and technology – a snapshot capturing the seemingly infinite variety of human ingenuity

SCIENCE MUSEUM LONDON

Copper cavity made by CERN in Geneva, Switzerland, 1988–89. Radio-frequency cavity used in the Large Electron Positron accelerator, acquired for the *Collider* exhibition

eRanger ambulance based on motorbike and sidecar, South Africa, 2000–09. Transported expectant mothers to hospitals in Sierra Leone, Liberia, southern Ethiopia, Kenya, Malawi and Uganda

Kit Yamoyos anti-diarrhoea kits by Colalife, 2012. Medication, rehydration salts and toiletries taken to remote areas in a charity initiative piggybacking on the Coca-Cola supply chain

Penicillin wooden chest, c. 1939, used by Major Scott Thomson, RAMC. Believed to have transported the vital penicillin supplies to north Africa during the Second World War

Zener cards: ESP cards for testing extrasensory perception, USA, 1937. Named after their inventor, American psychologist Karl Zener

'First' smartphone: Simon Mobile Communicator, by IBM with BellSouth, 1995. Ultimately a commercial failure, it was the first device to bring together many key components of the smartphone



RECENT ACQUISITIONS



Coxon propeller, 2005–06. Prototype self-pitching three-blade carbon-fibre cyclic-pitch propeller, designed and made by John Coxon, Pulborough, West Sussex, England

Automaton writing, 1825–35. Pen-and-ink automatic writing on an oval sheet of paper, by an automaton, the 'Draughtsman-Writer' by Henri Maillardet, Europe

Bierrum International Ltd contracts archive, c. 1927–80. A company involved in the design and construction of the majority of chimneys and cooling towers built in the UK

Tandy Radio Shack TRS-80 microcomputer system, made in USA, 1977, by Radio Shack Corporation. One of the first truly successful mass-produced personal computers

Opposite: Hexrotor surveillance drone, 2009, acquired by the Museum of Science & Industry

This page: Copper cavity from CERN and the eRanger ambulance

CONTINUED →

LANDMARKS IN INGENUITY: MORE RECENT ACQUISITIONS

MUSEUM OF SCIENCE & INDUSTRY MANCHESTER

Hexrotor surveillance drone, 2009. Developed by the University of Manchester, representing innovations in aerospace and military and law enforcement technologies. Previously exhibited in *Antenna* at the Science Museum

Photographic prints, c. 1900–20. Photographs taken at the premises of John A Wood Ltd, Harpurhey, Greater Manchester, showing workers operating textile machinery including Jacquard looms

Hosiery sewing machine, c. 1952. Used by an Altrincham woman who successfully combined her home repair business and her family life. Having nylon stockings repaired presents a contrast to today's throwaway culture

Props and costumes, c. 2003–13, from the Channel 4 TV series *Shameless*, filmed in Manchester and exported globally. They represent both the creative industries and popular perceptions of post-industrial society

Child's hire bicycle, c. 1996. From the National Cycling Centre (Manchester Velodrome), representing Manchester's continuing role as the home of British cycling, inspiring future generations of competition cyclists

NATIONAL RAILWAY MUSEUM YORK

Railway-inspired child's bed set made for Christopher Oldham in 1934. Includes a bed in the style of a railway carriage and a steam engine dressing table

London & South Western Railway dining car no. 72, 1907. Acquired to house the NRM's First World War exhibition, and to be partially restored as an ambulance carriage

British Railways poster, 1962, forbidding 'boys' from 'engine spotting' at Birmingham New Street station. An early example of trainspotting being banned on safety grounds

Publicity material from the pressure group Bring Back British Rail, 2013, campaigning for the re-nationalisation of Britain's railways

Plate from the London & North Eastern Railway locomotive *Hush-Hush*, 1928. Saved by an apprentice and probably the only surviving part of the engine's experimental boiler



Left: Hosiery sewing machine
Above: L&SW dining car from 1907 and BR poster from 1962
Right: A widescreen cinema first

NATIONAL MEDIA MUSEUM BRADFORD

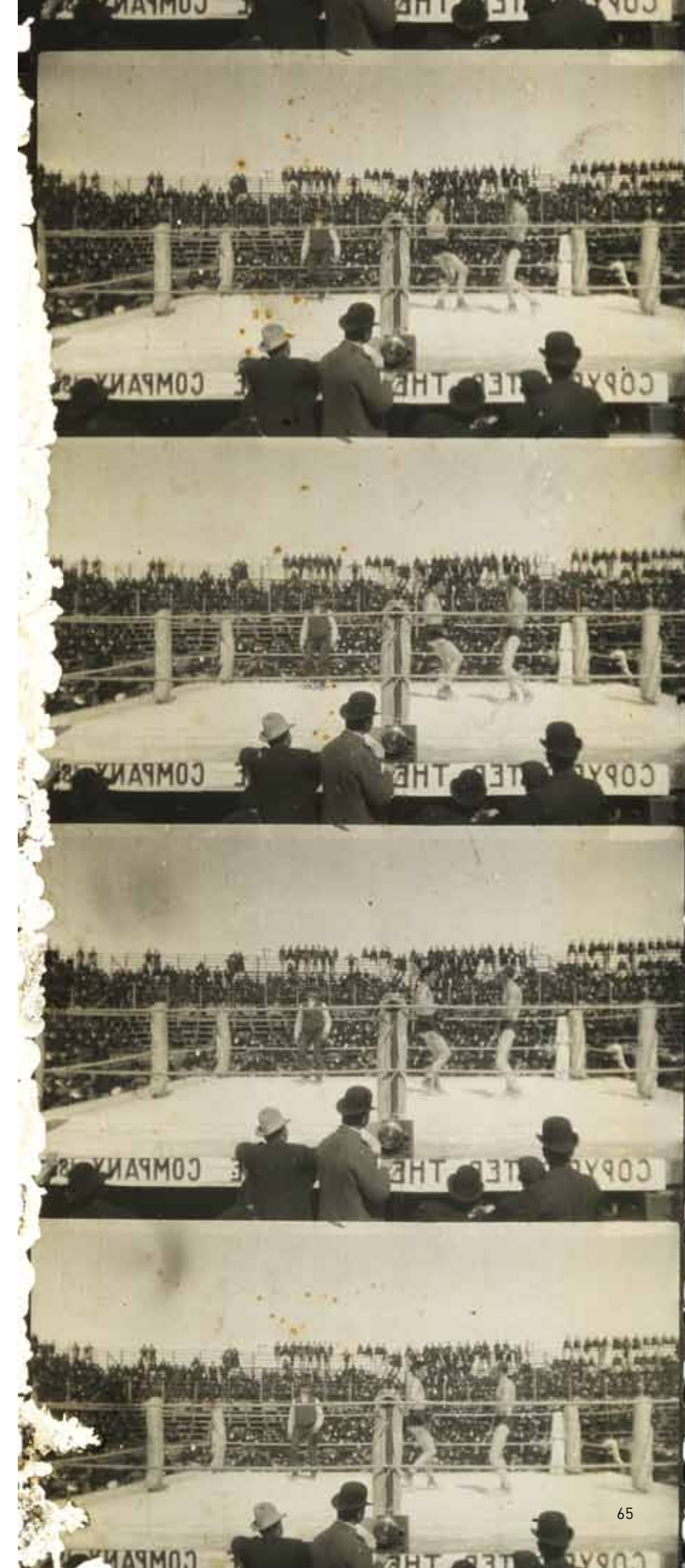
The fight between James J Corbett and Bob Fitzsimmons, 1897. Strip of widescreen film containing five frames of cinema's first feature-length documentary

SABA Jim Nature, 1994. This television receiver was designed by the famous and innovative French designer Philippe Starck with biodegradable and recycled materials

Video Traveller portable VHS video player, 2002. An early in-car video entertainment system – fitted with mains and car adapters – that often kept little ones occupied on long trips

Martin Parr, *The Non-Conformists*, 2013. Series of 77 prints from Hebden Bridge and the Calder Valley created by Martin Parr's studio for the *Only in England* exhibition, 2013

'Talkback in Nicam' system developed by TV-am, 1993. Live outside broadcasts required a speech channel to convey the director's talkback from studio to location



FINANCIAL OVERVIEW: REASONS TO BE CHEERFUL

Jonathan Newby, right, SMG Chief Operating Officer, assesses a buoyant year for revenues

The gradual and ongoing reduction in the Science Museum Group’s core funding serves only to ignite our imagination and fuel our energy at finding new ways to raise much-needed funds. We have made sure that SCMG Enterprises – our core businesses of shops and cafés – are as effective as possible, whilst at the same time looking for new and different ways of driving value from all our Museums’ endeavours.

Income from commercial trading has increased steadily over the last seven years, with the overall contribution to the Group from our Enterprises businesses standing at a record £3.2 million. Particular highlights from 2013–14 included a boost to our retail sales in support of the Great Gathering at the National Railway Museum, catering sales at all sites exceeding expectations, and it has been another excellent year from the Events team, who found new ways to offer our five amazing and unique venues for corporate hire.

Proactively asking visitors for a donation on their way into our Museums has proved as successful as it is simple and SMG now leads the sector in this way. Our dedicated Visitor Giving teams raised more than £2 million last year with donations at our Museums in London, York, Shildon and Manchester proving particularly strong. In some



We have also been successful in finding other new sources of funding, one of which is a new DCMS loans programme. This is a pilot scheme whereby the Treasury has made funds available to DCMS for its leading sponsored Arm’s Length Bodies, who have been invited to submit a business case to borrow money for capital projects at very competitive rates. The scheme is designed to provide funding that will allow our Museums to invest in income-generating activity for which fundraising might otherwise prove difficult. SMG has been successful with two applications which together total about £7.8 million.

The cumulative effect of this surge of activity has been to lessen SMG’s dependence on Grant in Aid through identifying increasingly innovative ways to drive new income; this has become something of a theme over recent years, embodying the Group’s ethos of being entrepreneurial, extrovert and efficient.

cases we have had to rearrange some of the furniture to ease visitor flow and to make the whole process smoother and less intrusive, but the level of support from our visitors has been overwhelming. And, our success in this area has led to another burgeoning business model – providing consultancy on the ‘science of asking’ to colleagues in other heritage organisations across the UK and further afield.



To infinity and beyond: Fly Zone’s new green-screen photo studio at the Science Museum

GROUP FINANCIAL SUMMARY 2013–14

The Science Museum Group is more indebted than ever to the generous sponsors, trusts, foundations, individuals and other supporters whose contributions helped our Museums to deliver a wide range of programmes, from major capital projects and innovative contemporary science displays to our work with schools and popular late-night openings.

Income from visitor donations exceeded £2 million – an increase of 29% compared with the previous year. In these difficult economic times this support is more critical than ever. Without it we would struggle to achieve the extraordinary range and depth of activities our Museums continue to deliver.

Our Government grant has again fallen this year – a reduction of 3% compared with 2012–13 – and the years ahead are likely to become ever more challenging.

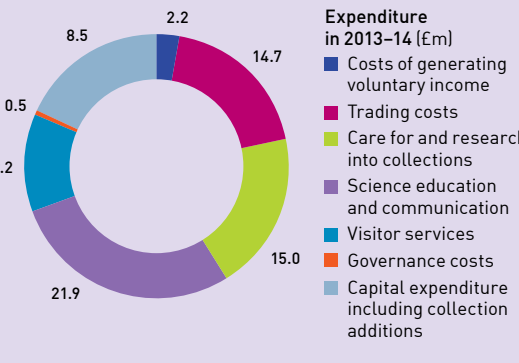
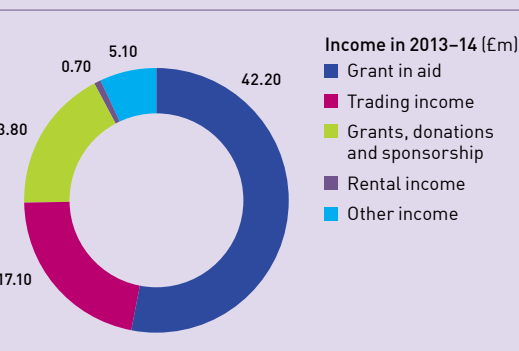
In order to meet the continuing reductions in our Government grant and fund our ambitions for the future we have placed a strategic focus on income generation. Self-generated income represented 47% of total incoming resources this year, compared with 40% last year – testament to the success of this strategy. Profit from our commercial activities exceeded

£3 million, an increase of 8% on the previous year. Furthermore, we generated £500,000 from our ticketed exhibitions *Collider* and *Only in England*, exceeding forecast by 40%.

The Group’s success in generating commercial income together with the generosity of our supporters has enabled us to continue to balance our budgets without compromising on either visitor experience or the care of our collections. However, our public funding continues to fall and this has necessitated a continued focus on cost-reduction strategies across our Museums, including a reduction in staff numbers.

As a Group we continue to become more focused, leaner and more efficient, but if public funding continues to fall and economic uncertainty persists we will have to review the scale and range of our operations. Even in the most difficult of circumstances, however, we will endeavour to ensure as many people as possible can enjoy our remarkable collections.

These figures are extracted from draft financial statements. The full Annual Report and Accounts is available on our website: sciencemuseum.org.uk/group



SMG VISIT NUMBERS 2013–14

Total number of visits to the Museums	Science Museum	Museum of Science & Industry	National Railway Museum	NRM Shildon	National Media Museum	All Science Museum Group
Outturn 2012–13	3,084,000	642,000	727,000	203,000	493,000	5,149,000
Outturn 2013–14	3,342,000	669,000	926,000	296,000	479,000	5,712,000**

Visits in education groups	Science Museum	Museum of Science & Industry	National Railway Museum	NRM Shildon	National Media Museum	All Science Museum Group
Outturn 2012–13	400,000	64,000	40,000	*	*	*
Outturn 2013–14	442,000	54,000	39,000	28,000	26,000	590,000**

Information is sourced through both internal and periodic independent visitor surveys.
* Methodology in recording visits in education groups was changed to align with the rest of the Group. It is not appropriate to compare year on year.
** Any anomalies in totals are due to roundings.

A YEAR FOR BREAKING RECORDS
A record 5,712,000 visitors came to our Museums over the past year, an increase of almost 11% on the previous year. **Our digital audience** is growing at an even faster rate, with visits to SMG websites up 29% at 26,460,000. **Visits to the Science Museum** totalled 3,342,000, which broke all previous records. **Annual visit numbers** for the National Railway Museum reached 926,000, up more than 25% on the previous year. NRM Shildon welcomed 120,000 visits over the course of only eight days for the Great Goodbye. **The Science Museum** welcomed a record-breaking 442,000 visitors in education groups, of which 341,000 were school pupils.

OUR GENEROUS SUPPORTERS

With many thanks to all our visitors who have kindly made a donation to support the work of the Science Museum Group

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Thank you to all of our exhibition visitors	
All those who wish to remain anonymous	
All those who have supported the Science Museum through a bequest in their will	
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All those who have supported MOSI through a bequest in their will	
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Thank you to all those supporters of our rich exhibition and gallery programme, including the Mallard 75 celebration	
All those who have supported the NRM through a bequest in their will	
All those who wish to remain anonymous	
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With many thanks to all NMeM Members	
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David J P Nevell	
Raymond Price	
Ian Robinson	
Andrew Scott	
Stately Trains	
Dean Welbourn	
HOW YOU CAN SUPPORT US	
We are a charitable group of museums and support from our visitors and friends is essential. We are grateful to all our supporters over the past year and every donation has great value to us in funding our work. If you would like to make a donation, to any of the Museums, please phone 020 7942 4081 or e-mail development@sciencemuseum.ac.uk	
BECOME A PATRON OF OUR MUSEUMS	
Each year we need your help and support in order to inspire the next generation of scientists and engineers, to create ambitious exhibition and learning programmes, and to protect our world-class collections.	
Patronage is a hugely important way of supporting the work of our Museums with an annual gift and we currently have a Patrons programme at both the Science Museum and National Railway Museum. In return for your gift, we offer all of our Patrons a range of tailored benefits to thank you for your support.	
Our Patrons enjoy special access to our collections and a programme of exclusive events, including behind-the-scenes tours, invitations to exhibition openings, and talks by renowned scientists, our expert curators and industry leaders.	
If you are interested in finding out more about becoming a Patron, including the benefits we offer, please do speak to us.	
At the Science Museum please contact the Development team on 020 7942 4034 or e-mail patrons@sciencemuseum.ac.uk	
At the National Railway Museum please contact the Development team on 01904 685774 or e-mail development@nrm.org.uk	
WHERE FUNDS COME FROM	
Fundraising at the Science Museum Group is based on developing long-lasting and mutually beneficial relationships with all our funders. We view supporters as investors in our ambitions and values and we hold varied events to grow their interest in our Museums.	
Individual donors play a significant role at SMG. They recognise the importance of inspiring the next generation and the unique role we play in achieving this.	
Our Corporate sponsors support us across a range of galleries and exhibitions and in return we offer a bespoke range of tangible benefits to meet their needs.	
Grants from private trusts, foundations and Government help SMG to share learning expertise. Many grant-giving bodies are experts in education, heritage or wider public engagement and the benefits are usually mutual.	
Visitor giving has made a huge difference to our revenue and we are delighted to report that the past year alone we have raised more than £2 million in donations.	

A RENOWNED FAMILY OF MUSEUMS

SCIENCE MUSEUM GROUP OBJECTIVES

The Science Museum Group (SMG) is devoted to the history and contemporary practice of science, medicine, technology, industry and media throughout which the common bond is human ingenuity. Our collections form an enduring record of scientific, technological and medical change since the 18th century. SMG incorporates the Science Museum, the Science Museum Library and the Wellcome Museum of the History of Medicine in South Kensington; the Museum of Science & Industry in Manchester; the National Railway Museum in York and Shildon; and the National Media Museum in Bradford. Our two major collections stores are located at Wroughton in W and Blythe House in West Kensington.

Our strategic objectives across SMG are to aspire to the highest international museum standards in the care and preservation of collections, scholarship, programming, learning and advocacy for our subject areas; strengthen our core narratives and deliver dynamic gallery displays; implement clear audience strategies that focus on providing life-enhancing experiences; extend our reach nationally and internationally; make optimum use of our estate; be an organisation that is extrovert, entrepreneurial, efficient and dedicated to the development of great people.

THE CHARITY

The Board of Trustees of the Science Museum was established under the National Heritage Act 1983. SMG is an exempt charity under the Second Schedule of the Charities Act 1993.

The Science Museum Group comprises:

Science Museum, London
Museum of Science & Industry, Manchester
National Railway Museum, York and Shildon
National Media Museum, Bradford
SCMG Enterprises Ltd



Trustees of the Science Museum Group and the Director pictured at the Annual Dinner

BOARD OF TRUSTEES OF THE SCIENCE MUSEUM GROUP

The Board of Trustees of the Science Museum is responsible for the whole of the Science Museum Group. The Trustees, who may number between 12 and 20, are appointed by and are responsible to the Prime Minister through DCMS. The Director of SMG, as Chief Executive Officer, is responsible to the Board of Trustees, and as Accounting Officer is accountable to DCMS for compliance with the Management Statement and Financial Memorandum.

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Professor Dame Athene Donald DBE
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Professor Sir Howard Newby CBE
Dr Gill Samuels CBE
Mr James Smith CBE
Mr Christopher Swinson OBE
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New Fellows of the Science Museum (FScM)

Peter Higgs CH FRS FRSE
Lord Rees of Ludlow OM, Kt, FRS
Michael G Wilson OBE

OUR DISTINGUISHED ADVISERS

Science Museum Advisory Board

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Mr Michael Emmerich
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Mr Peter Fell (Vice-Chair until February 2014)
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Mrs Gillian Cruddas MBE, until October 2013
Lord Faulkner of Worcester (Trustee and Observer)
Mr Christopher Garnett OBE
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Professor Ludmilla Jordanova (Trustee), from September 2013
Mr Simon Linnett (Trustee)
Mr Darren Richardson, from May 2013
Mr Adrian Shooter CBE
Mr Anton Valk
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National Media Museum Advisory Board

Chairman: Lord Grade of Yarmouth CBE (Trustee)
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Lady Chisholm (Trustee)
Mr Philippe Garner
Mr Matt Locke
Ms Zahida Manzoor CBE
Mr Roger Mosey, until May 2013
Dr Annette Nabavi
Mr Simon Norfolk, until November 2013
Mr Tony Reeves
Ms Carolyn Reynolds
Ms Gillian Reynolds MBE

SCIENCE MUSEUM, LONDON

Director: Ian Blatchford
Science Museum
Exhibition Road
London SW7 2DD
www.sciencemuseum.org.uk

OBJECTIVES

The Science Museum’s mission is to make sense of the science that shapes our lives. This commitment drives everything we do. Through our world-class collections of historic objects, galleries, interactive experiences and our learning programmes we aim to be the leading international museum championing the understanding, enjoyment and prestige of science in modern society. Last year we set out our Strategic Ambitions for the next decade, including a commitment to focus on the urgent choices faced by society and the fundamental science and technology that underpin them.

AUDIENCES

This year 51% of visitors to the Science Museum came in family groups. A further 13% of our visitors came in education groups, and we remain the UK museum with the most recorded visits by this segment. Adults visiting independently make up the remaining 36% of our audience. For many visitors to the capital the Museum is a must-see destination, with 42% of our general admission visitors coming from overseas and 20% from outside of London and the Southeast. The Science Museum’s digital reach is global, with 43% of our website traffic coming from outside the UK.

ACHIEVEMENTS

This year there were 3.34 million visits to the Museum. This is the highest total since current records began and included the busiest ever February half term, with nearly 150,000 visits in nine days and almost 20,000 in a single day. The Museum received a number of



awards including: three for last year’s *Web Lab* exhibition, one of which was the People’s Voice Award for Best Visual Design at the Webby Awards; Silver in the Visit England Access for All Awards for work to improve access; Gold for the desks and maps designed to support visitor giving at the DBA Design Effectiveness Awards; and an Innovation award from the Chartered Institute of Building for the Hemcrete store at Wroughton.

FUTURE AMBITIONS

The programme of major exhibitions continues with the opening of *Cosmonauts* later in 2014. Our ambitions to tour our major exhibitions, both within SMG and internationally, will be realised this year: *Collider* has already transferred from London to

our sister Museum in Manchester, after which it moves on to international venues. Significant development and fundraising work has taken place on Masterplan projects, including the *Information Age* gallery, and new mathematics and medical galleries. *Information Age* opens in autumn 2014 with its associated learning programme and digital resources. Our new research centre is planned to open for autumn 2015.

Above: Model of machine for grinding concave mirrors (after Leonardo da Vinci), by Goacher Model Engineering. From the permanent collections of the Science Museum, and recently displayed in the Smith Centre exhibition of models

MUSEUM OF SCIENCE & INDUSTRY, MANCHESTER

Director: Jean Franczyk
Museum of Science & Industry
Liverpool Road, Castlefield
Manchester M3 4FP
www.mosi.org.uk

OBJECTIVES

The Museum of Science & Industry tells the story of where science met industry and the modern world began whilst signalling Manchester as a 21st-century city of science. The Museum sits on one of the nation's most historic industrial heritage sites. Covering 7.5 acres and including six listed structures, this small corner of Manchester is one of the key places in the UK, and therefore in the world, where the Industrial Revolution began. Our ambition is to realise its potential as an internationally significant museum with a strong Manchester personality.

AUDIENCES

This year the Museum welcomed 54,000 visitors in education groups to explore the site, story and collections, with 37,000 visitors from schools – a total of 248,000 visitor learning instances. Independent adults made up 26% of overall visitor numbers, visitors in family groups made up 66% and the remaining 8% of our visitors came in educational groups. Among general admissions visitors, 74% came from Greater Manchester and the Northwest region, with a further 16% from elsewhere in the UK and 10% from overseas.

ACHIEVEMENTS

A major success this year was the Wellcome Collection exhibition *Brains: Mind as Matter*, which attracted 100,000 visits. Through this exhibition the Museum succeeded in its objective of drawing in new adult audiences. In this 30th birthday year on its current site, there were 669,000 visits to the Museum. Manchester Science Festival

(MSF) is our annual signature event, bringing stakeholders together from across the city and beyond, and leading the creative exploration of science in Manchester. This year's festival received nearly 90,000 visits – an increase of 7% on the previous year. Our holiday programming has been particularly successful, with 53,600 visits during our Steam, Sweat and Sewers event over February half term.

FUTURE AMBITIONS

In the coming year, the Museum will roll out its Masterplan. This has six priorities under Phase 1, including the creation of a new temporary exhibition gallery, redevelopment of

the public realm and reinterpretation and development of the historic Station Building. This will be followed by projects to deliver major new galleries showcasing modern Manchester and contemporary science, as well as world-class interactive galleries. In partnership with the Science Museum, the *Collider* exhibition transferred to Manchester as part of a broader strategy to share public programming across SMG, and also specifically to increase our contemporary science programming.

In September 2014 Jean Franczyk leaves Manchester to take up the post of Deputy Director of the Science Museum in London.



Poetry in motion: Magnificent standing engines in steam daily in the Power Hall

NATIONAL RAILWAY MUSEUM, YORK AND SHILDON



Refurbished on its centenary: the Lancashire & Yorkshire Railway Signalling School, the world's oldest model railway

Director: Paul Kirkman
National Railway Museum
Leeman Road
York YO26 4XJ
www.nrm.org.uk

OBJECTIVES

The National Railway Museum comprises a main Museum in York and a second Museum in Shildon, County Durham, which opened in 2004. The NRM in Shildon is operated in partnership with Durham County Council and houses some of the National Collection in a new building. A charismatic 19th-century site features the former workshop of Timothy Hackworth, built for the world's first passenger railway of 1825. Shildon is known as the 'cradle of the railways'.

During the past year a strategic review was carried out and a new vision agreed: 'The NRM is the prime showcase in the world for the huge impact railways and their technology have had in the past and will have in the future on the people, the economy, the society and the environment of Britain and the wider world.'

This is supported by the following objectives: maintain our collection and increase research and scholarship based on our collection; produce an engaging and informative public programme, according to our five-year plan, which engages new audience segments with our overall narrative of the railways; progress our Masterplan; create an efficient and effective organisation and focus on opportunities to raise additional income.

Paul Kirkman was confirmed as Director of the Museum on 12 July 2013, following a one-year secondment from DCMS.

AUDIENCES

Our Museum in York continues to appeal successfully to family groups, which make up 50% of visitors. Independent adults account for 46% of visitors, whilst 4% come in education groups. The Museum is a particular attraction for railway enthusiasts, who make up 30% of general admissions visitors. Of our general admissions visitors, 51% come from outside the Yorkshire and Humber region, including 8% who are from overseas.

ACHIEVEMENTS

There were 926,000 visits to the Museum in York this year – the highest since current records began; and 296,000 to Shildon – 86,000 more visits than the next busiest year. During the Great Gathering in York 244,000 visited over 32 days, and 120,000 came to the Great Goodbye in Shildon over nine days as part of the *Mallard 75* celebrations. The Museum was named winner of the John Coiley Award, as part of the Heritage Railway Association's Annual Awards 2013. The Museum also received a Good Place to Come award from the Children's Society following an audit by local young people with disabilities.

FUTURE AMBITIONS

Next year we shall be focusing on interpretation of our collections to tell the stories of the railways, their impact and the passenger and worker experience, supported by a new research strategy, public programme and learning offer. In 2014–15 we shall begin the first stage of our Masterplan with commercial developments in the South Yard.

NATIONAL MEDIA MUSEUM, BRADFORD

Director: Jo Quinton-Tulloch
National Media Museum
Pictureville
Bradford BD1 1NQ
www.nationalmediamuseum.org.uk

OBJECTIVES

This year the Museum carried out a re-visioning process to ensure its long-term sustainability. The revised mission is to explore the science, technology and art of the still and moving image, and its impact on our lives. Our vision is to be a dynamic and inclusive museum, internationally recognised for its world-class collections and for using them in engaging, meaningful and inspiring ways. To achieve this, our objectives are:

- To develop and implement our plans for future financial sustainability
- To care for, develop and share our collections and set new standards
- That every visitor will have a consistent cultural experience, and engage with a physical or virtual environment of the highest quality
- To change perceptions and practice through participation, community engagement and partnerships, to enrich our work and our visitor offer
- That learning will be part of everything that we do, with a focus on science and technology, drawing inspiration from our collections
- That targeted, effective external communications will raise our profile and reputation in all media
- To develop our staff to ensure they deliver to their full potential and in turn provide the best experience for our visitors, stakeholders and partners

Jo Quinton-Tulloch became Director of the National Media Museum in 2013.

Edward Turner's children, 1901: the earliest colour moving pictures, discovered in our vaults

AUDIENCES

The Museum has two broad audiences: those who visit primarily for the galleries and exhibitions and those who visit mainly for the full-length film programme. Last year 18% of all visits were for the cinema, 52% were in family groups visiting the galleries, 24% were independent adults visiting the galleries and 5% were educational groups visiting the galleries. The Museum as a whole is an important attraction and resource for communities in Yorkshire and the Humber, with 81% of our general admissions visitors coming from the region.

ACHIEVEMENTS

General visits to the Museum have increased, with 365,000 for the galleries and exhibitions – 26,000 more than last year. The Museum celebrated its 30th birthday in June with a weekend of activities attended by almost 6000 people, including many new visitors. Events included a performance by the Punk Science team in front of thousands of spectators



gathered in Bradford's City Park for the annual Bradford Festival. In November, the Museum was the Yorkshire host for the BBC's *Children in Need* broadcast, generating over 2000 visits to the Museum.

FUTURE AMBITIONS

With changes to the National Curriculum later in 2014, the Museum will continue to develop new learning programmes that will include a strong STEM focus. The Museum is also a partner in two doctoral training consortia, the Northern Bridge Doctoral Training Partnership led by the University of Newcastle, and The White Rose College of the Arts & Humanities led by the University of York. Between 2014 and 2019 the Museum will offer a number of placements for doctoral students to support their research and skills development.

In 2014–15 the National Media Museum will also begin working with a new commercial partner to run the cinema operation.

SCIENCE MUSEUM AT WROUGHTON

The 545-acre Wroughton site in Wiltshire is a vital resource for the whole Group. A former airfield, this vast site and the functions that operate here underpin and support a whole range of Museum-wide activities, including storage, conservation, exhibitions and loan activities, as well as providing access to researchers. The site is also used to deliver commercial activities and events, and is leading on the generation of sustainable energy.

Wroughton is home to the Science Museum Group's big-object store and its Library & Archives, with 30,000 objects and 26 km of books and archives housed in ten former aircraft

hangars (including an award-winning Hemcrete store). A variety of smaller buildings are used as offices, collection storage areas and conservation laboratories.

The range of collections is extraordinary. Over 4 km of material from the Science Museum Library collection were successfully moved from Imperial College London to stores at Wroughton, the first stage in the project to deliver world-class new library and research facilities for the Science Museum.

Vehicle line-up: three among 30,000 big objects



BLYTHE HOUSE COLLECTIONS STORE, LONDON

Blythe House is the Science Museum Group's small-object store at Olympia. The Group currently occupies a third of this grand Edwardian Post Office building, shared with the V&A and the British Museum. The bulk of the Science Museum's collections are stored there, and the operations at Blythe House provide critical behind-the-scenes support for public-facing results.

Activity focuses on the storage and preservation of smaller-scale collections and those with particular environmental requirements, such as photographic images. It also has an object conservation laboratory, photographic studio and the object movement team to support gallery and exhibition work and loans of our objects to other institutions.

A major project for the team based there this year has been the preparation of the 700 objects which will be displayed in the new *Information Age* gallery opening this autumn.



While the building offers a grand façade in a central London location, it is not a sustainable long-term solution for the storage of Science Museum Group collections, and work is under way to establish the feasibility of leaving Blythe House in the longer term.

Cultivation event: Guest tour of Blythe House

35 YEARS A PERSUADER

Jo Quinton-Tulloch, Director of the National Media Museum, pays tribute to a remarkable woman who leaves a profound legacy within the Group

It is increasingly rare to find someone who dedicates their entire career to one institution, building incomparable expertise and knowledge. But Heather Mayfield bucks the trend. This year she retires as Deputy Director of the Science Museum after 35 years of service in the Group.

Heather joined the Museum in 1979 as a Museum Assistant cataloguing items in the medical collection. That first temporary role was extended in 1982 when the institution embarked on an ambitious project that led, eventually, to the National Museum of Photography, Film & Television. Never able to resist a challenge, Heather moved to Bradford

to join the team responsible for its creation and opening.

Back in London, Heather has been involved in almost every major project in the Science Museum over the past 25 years. She has been instrumental in securing millions of pounds in sponsorship, managing key strategic relationships, ensuring the Museum has always been at the forefront of science engagement. She has received an impressive list of awards.

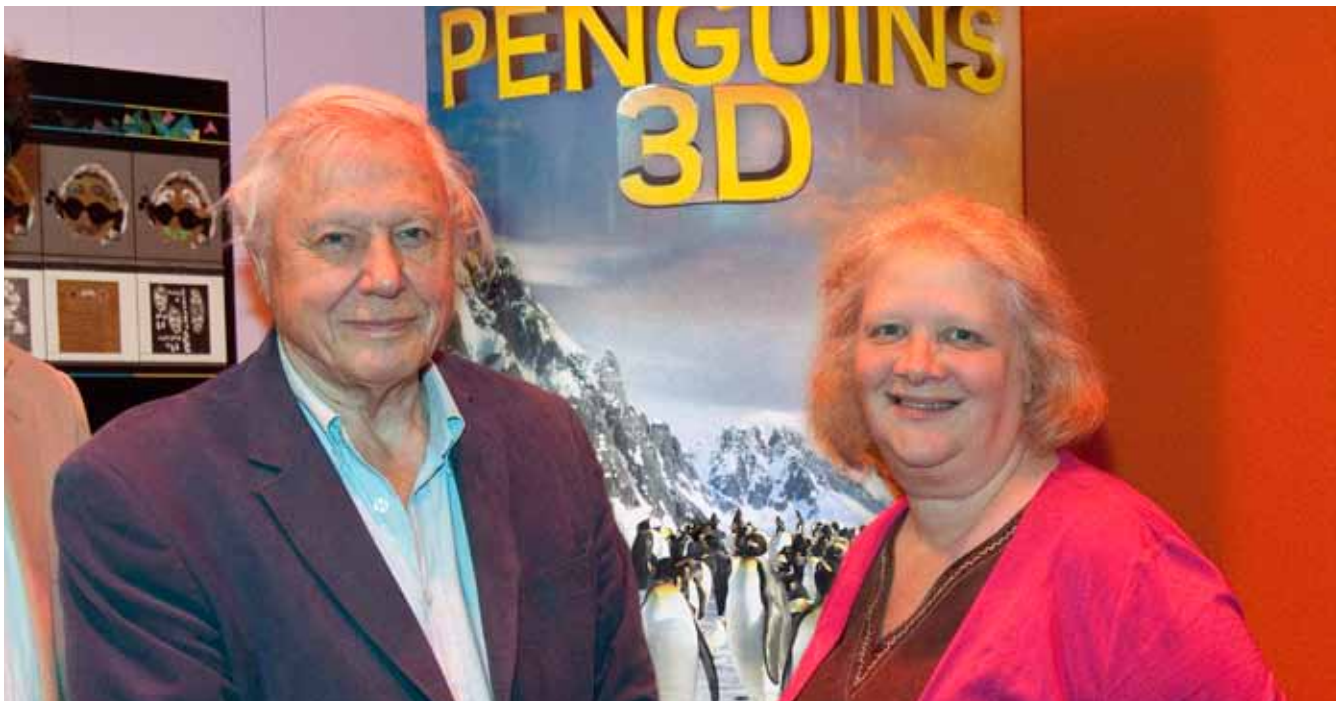
Throughout her career Heather has tirelessly championed new ways of making museum collections available to the widest number of people. In the 1990s she led the delivery of the first temporary exhibition programme dedicated to contemporary science, Science Box, which tackled challenging and sensitive subjects such as DNA fingerprinting and passive smoking. This ground-breaking programme laid the foundations for the Wellcome Wing and then the Dana Centre – both absolutely ahead of the curve. Who else would have commissioned a project in which visitors dress up as cockroaches and tour the Museum while exploring the impacts of climate change on our world? The Science Museum has always attracted visionaries. But the hardest part of any new way of working is establishing it as the norm. Throughout

her career Heather has shaped and delivered projects and practice so that the Museum's approach to informal learning, interactivity, contemporary science and science communication has become firmly embedded within the DNA of the Museum. Heather is frequently approached by peer organisations for advice and she has sat on numerous boards and committees, including several in the USA.

Her passion for the collections is matched by her unwavering support for her teams. Heather has managed, mentored and inspired countless individuals in the organisation and so many of them have progressed to other roles and other organisations – their careers all benefiting from time spent together. Her humility and warmth resonate alongside her determination and she instils absolute confidence in the teams that work with her. Heather's retirement is a great loss to the Group, but her legacy will continue to inspire millions of visitors.

Heather Mayfield continues her association with the Museum as Consultant for the Medical Galleries project

Hosting a VIP reception following an IMAX screening: Heather Mayfield, Deputy Director of the Science Museum with Sir David Attenborough



SMG REACH WITHIN THE UK 2013–14

1 This year proved the power of authenticity; big projects anchored in real science. Tangible objects matter enormously to people

IAN BLATCHFORD SMG DIRECTOR

GLASGOW

SM's adult Lates programme generated discussion when Scott McKenzie-Cook, Special Events Manager, gave a presentation at the BIG Conference in Glasgow

KILMARNOCK, EAST Ayrshire

Photographs such as the portrait of 'Clementina Maude', shown right, were loaned from the collections of NMeM to the Dick Institute, an important cultural venue in Scotland

ARMAGH

A Blue Streak rocket engine was loaned to Armagh Planetarium by the Science Museum

SMG MANCHESTER

The Museum of Science & Industry produced its seventh Manchester Science Festival, an 11-day celebration of science in partnership with local universities which involved over 100 events throughout Greater Manchester

NANTWICH, CHESHIRE

A BAC Jet Provost T4 RAF training aeroplane was loaned to Hack Green Nuclear Bunker by MOSI

WOLVERHAMPTON

'The International' Lancaster camera was one of several objects loaned by NMeM for *From Darkroom to Digital* at Wolverhampton Art Gallery

SWINDON

A large number of NRM loans went to Steam: Museum of the Great Western Railway in Swindon, including a fire engine

BLAENAVON, GWENT

Preston Rambler, a Super D loco, was loaned to Pontypool & Blaenavon Railway Company by NRM

EXETER

SM's *Energy Show* played a 34-gig tour across the south which also took in Canterbury, Tunbridge Wells, Reading, Cambridge and Brighton

FALMOUTH, CORNWALL

A model of *Kon Tiki*, the raft used by Norwegian explorer Thor Heyerdahl in his 1947 expedition across the Pacific Ocean, was loaned to the National Maritime Museum by the Science Museum

OUR COLLECTIONS

In 2013–14 the Science Museum Group loaned 1641 objects to 191 different venues in the UK, a selection indicated in green

SM – Science Museum, London

MOSI – Museum of Science & Industry, Manchester

NRM – National Railway Museum, York and Shildon

NMeM – National Media Museum, Bradford

NEWCASTLE

SMG and Tyne & Wear Archives & Museums signed a five-year memorandum of understanding to strengthen our established relationship. Both organisations exchanged loan objects that had never been on public display

SMG SHILDON

NRM Shildon drew record crowds to its Great Goodbye celebration for the six A4 locomotives, and hosted a farewell gala featuring *Steamsong*, an opera commissioned by the Arts Council

SMG BRADFORD

The National Media Museum hosted two world-class annual film festivals, the Bradford International Film Festival and Bradford Animation Festival, both celebrating their 20th anniversaries

SMG YORK

The vintage steam locomotive *Mallard* toured from the National Railway Museum to Grantham, Doncaster and Barrow Hill engine shed, Chesterfield, as part of the *Mallard 75* anniversary celebrations

NOTTINGHAM

MOSI's Park Green Mill clock, shown right, was loaned to Nottingham Castle as part of Jeremy Deller's *All That is Solid Melts into Air* exhibition

LEICESTER NORTH

NRM continued to collaborate with Leicester City Council and the Great Central Railway on the development of the new Great Central Railway Museum at Leicester North

NORWICH

A touring exhibition, *Curiosity: Art and the Pleasures of Knowing*, which visited Norwich Castle Museum, included loans from SM such as the ivory anatomical figures, shown right

SMG LONDON

Ian Blatchford, Director of the Science Museum and Chief Executive of the Group, was named among the *Evening Standard*'s 1000 most influential Londoners for 2013. SMG developed stronger links with the Royal Society, the world's leading science academy

CHEL TENHAM

Roger Highfield, SMG Director of External Affairs, took part in *The Times* Cheltenham Science Festival with Pulitzer Prize-finalist and bestselling science author James Gleick, and continues to be an adviser to the festival programme

CHICHESTER

David Rooney, SM's Curator of Time, Navigation and Transport, acted as a programme adviser for the internationally renowned diploma in conservation-restoration of clocks at West Dean College, Chichester



London & North Western Railway, G2 class Super D locomotive, built at Crewe in 1921



'The International' folding-stand camera by J Lancaster & Son, Birmingham, 1885–1905



Ivory anatomical figures with some internal organs removable, possibly German, 17th to 18th centuries



Portrait of 'Clementina Maude' by Lady Clementina Hawarden, albumen print, 1863



Double-dial longcase clock from Park Green Mill, Macclesfield, made by E Hartley, Macclesfield, c. 1810



Scale model of *Kon Tiki*, the raft used by Norwegian explorer Thor Heyerdahl to explore the Pacific Ocean



The universe cannot wish for a more perceptive eye than the Science Museum

ROBBERT DIJKGRAAF
DIRECTOR AND LEON LEVY PROFESSOR AT THE INSTITUTE FOR
ADVANCED STUDY IN PRINCETON



The National Railway Museum's celebration of Mallard's world speed record was a triumph, attracting an astonishing 364,000 visits

LORD FAULKNER OF WORCESTER
SMG TRUSTEE



The Museum of Science & Industry is a fantastic asset and will help keep the northwest's spirit of curiosity and innovation alive

PROFESSOR BRIAN COX
UNIVERSITY OF MANCHESTER



Our Bradford collections hold many treasures by media pioneers from the dawn of photography. These collections will drive the radical shift in perceptions that is required to attract more visitors into the National Media Museum

LORD GRADE
SMG TRUSTEE AND CHAIR, NATIONAL MEDIA MUSEUM
ADVISORY BOARD

OUR FIVE WORLD-BEATING MUSEUMS

Science Museum, London
Museum of Science & Industry, Manchester
National Railway Museum, York
National Media Museum, Bradford
National Railway Museum, Shildon

A YEAR FOR BREAKING RECORDS

Total attendances at all SMG Museums rose 11% this financial year to a record 5,712,000. The Science Museum hit an all-time high at 3,342,000, and achieved its biggest ever February half-term figure (140,000 over nine days with almost 20,000 people in a single day).

The National Railway Museum enjoyed its best year ever with a total of 1,222,000 visits. Numbers for NRM York leapt to 926,000, up more than 25% on the previous year. NRM Shildon welcomed 120,000 visits over the course of eight days for the Great Goodbye.

Visitor giving goes on booming: £2 million was received across the Group's five Museums. Staff in London and York benefited from new welcome desks which have won design awards.

The Science Museum welcomed a record-breaking 442,000 visitors in education groups, more than any other UK museum. Of these 341,000 were school pupils.

Our digital audience is growing at an ever faster rate, with visits to SMG websites totalling 26,460,000, a surge of 29%.

Cover picture Geniuses of modern theoretical physics at the Science Museum's *Collider* exhibition: Peter Higgs, Nobel Prize laureate and Emeritus Professor at the University of Edinburgh, who predicted the existence of the Higgs boson; and Stephen Hawking, Director of Research at the Centre for Theoretical Cosmology within the University of Cambridge. They are seen before a cross-section image of CERN's Large Hadron Collider, displayed in our exhibition, *Collider*, which is set to tour the world. Photograph by Nathan Dainty © Science Museum



The Science Museum helped fuel my fascination with physics. So it is wonderful to see that more young people than ever are getting the opportunity to feel that same inspiration

PROFESSOR STEPHEN HAWKING
AT THE LAUNCH OF THE COLLIDER EXHIBITION

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Edited by David Johnson
with generous input from staff at SMG
and its many bloggers

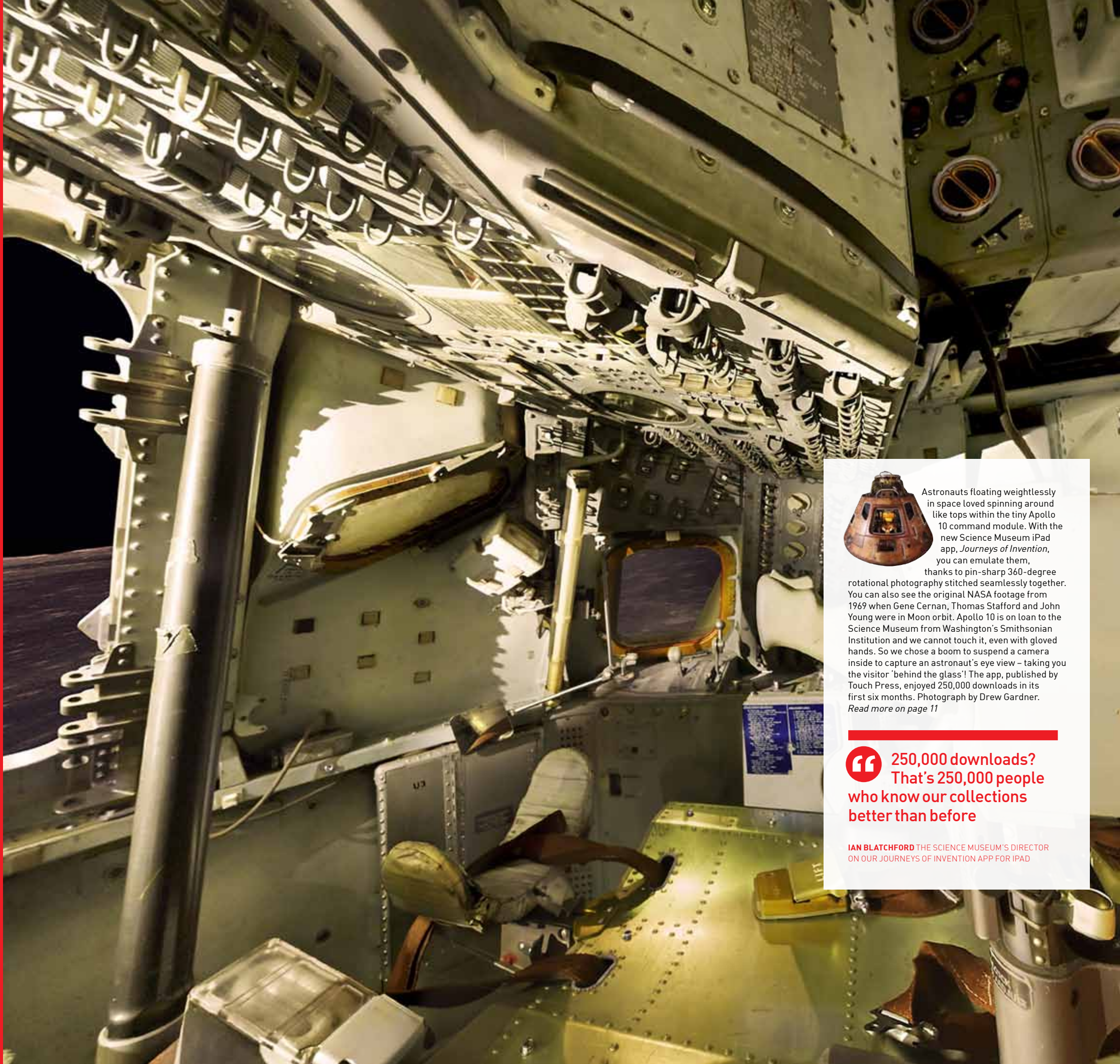
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Astronauts floating weightlessly in space loved spinning around like tops within the tiny Apollo 10 command module. With the new Science Museum iPad app, *Journeys of Invention*, you can emulate them, thanks to pin-sharp 360-degree rotational photography stitched seamlessly together. You can also see the original NASA footage from 1969 when Gene Cernan, Thomas Stafford and John Young were in Moon orbit. Apollo 10 is on loan to the Science Museum from Washington's Smithsonian Institution and we cannot touch it, even with gloved hands. So we chose a boom to suspend a camera inside to capture an astronaut's eye view – taking you the visitor 'behind the glass'. The app, published by Touch Press, enjoyed 250,000 downloads in its first six months. Photograph by Drew Gardner.
[Read more on page 11](#)



250,000 downloads?
That's 250,000 people
who know our collections
better than before

IAN BLATCHFORD THE SCIENCE MUSEUM'S DIRECTOR
ON OUR JOURNEYS OF INVENTION APP FOR IPAD