



m e m o





m e m o

mass extinction monitoring observatory

# a global monument

We are a collaboration of scientists and artists dedicated to building a global beacon for biodiversity: MEMO.

Though we have seen far into the reaches of space, all life known to science is still only to be found here on Earth. Biodiversity describes this glorious, glittering whole. However it is now under threat from the accumulated impact of human activities on a scale comparable to that which extinguished the dinosaurs.

From Stonehenge to the Taj Mahal we have always built monuments of stone. We seek to build a monument for our time, to bring together the best of the arts and sciences in reflection on the true wonder of this world: the variety of its life.

The stones of MEMO will embody an important but neglected record in the history of life. When compared to the fossil record, the 860 species of plants and animals assessed as extinct in modern times indicate the beginnings of a 'mass extinction event' akin to that which wiped out the dinosaurs 65 million years ago. Yet their images have never been collected together in one place, in any medium, anywhere. We propose that all of them be carved in simultaneous sculptors' residencies, in schools and other public spaces all over the world, in a great global symbol of respect for the natural world.



above: artist's impression of how MEMO could look at night CGI: © Adjaye Associates

left: public participation MEMO Festival, Portland 2009

far left: Hawaiian Haha tree, extinct in the wild by Harry Brockway, Portland 2008

“Public engagement is a crucial task because, as with so many such scientific issues, there is the persistent difficulty that by the time the issue seems urgent it will be largely too late to do anything about it. While biodiversity loss proceeds like geological lightning, it remains incrementally slow in ‘human-time’. Therefore those initiatives which can bridge the imaginative gap between geological and human timescales are essential.”

**Dr. Eric Chivian**

*Nobel Laureate and founder of the Center for Health and Global Environment at the Harvard School of Public Health*



right: artist's impression of the interior of MEMO  
© Adjaye Associates



Tim Smit



David Adjaye and Sebastian Brooke  
*Portland 2010*



Sir Ghillean Prance



These carved stones will form the walls of MEMO. The space enclosed will become a living arena for projection and performance, exhibition and installation, conference and festival with the mission to inform, to educate, to inspire. On-site and on-line, all programmes will link to schools and conservation initiatives all over the world. The ‘epic of evolution’ will be told and the solutions to halting biodiversity loss will be show-cased. While history is written in stone, the future is yet ours to shape.

The project is being pursued by MEMO, an educational charity based in the UK, in partnership with the E.O. Wilson Biodiversity Foundation in the US. The project was first conceived in 2006 by stonecarver and Project Director Sebastian Brooke. MEMO is led as Chair by Sir Ghillean Prance who, as Director of Kew Gardens, initiated the wonderful Millennium Seedbank in the 1990s. Sir Tim Smit, who co-founded the multi award-winning Eden Project, is Principal Adviser. We have a ‘triple-A’ design team headed by internationally acclaimed architect, David Adjaye, engineers, ARUP, and AECOM as cost consultants.

Support for the project is heartwarmingly wide-ranging. HRH The Duke of Edinburgh is the Royal Patron. Other Patrons include many leading scientists - and communicators of science - including Professor E.O. Wilson and Sir David Attenborough. The principal international authorities - the IUCN Species Survival Commission, which produces the ‘Red List’; and the Secretariat of the UN Convention on Biological Diversity – are committed supporters of MEMO.

“MEMO is an inspirational project that is sure to raise the profile of extinct and threatened species and reach out to previously untapped and wide ranging audiences.”

**Simon Stuart** *Chair, IUCN, Species Survival Commission*

# a magical location

“The MEMO Project is beautiful, it is powerful and its message is simple. Its location, like a sentinel surveying the vast landscape of life past and present on our fragile planet, is perfect. Its creation will provide a global icon to our need to respect and protect the natural world and will ask, in its mute testament whether we are worthy of the name we gave ourselves: Homo sapiens – the wise hominid.”

**Tim Smit** KBE *co-founder and CEO of the Eden Project, and Principal Adviser to MEMO*

MEMO will be built on the Isle of Portland on the south coast of Britain where a spectacular cliff-top site is being provided by the Crown Estate. Portland draws together themes of architecture, geology, and the natural environment to provide a photogenic setting of profound symbolic resonance and great educational power.

The source of fine Portland limestone, the island has provided the materials for great works of architecture ever since Roman times. Much of central London is built of Portland stone and the UN building in New York is faced with it. Set within the landscape from which its materials were cut, MEMO will be an unusually vivid example of sustainable construction. Fine carving stone, rough quarry blocks and aggregate for concrete – as well as the stonemasonry skills necessary to build the monument – will all be sourced from within a stone’s throw of the site.

Portland is also part of England’s only natural World Heritage Site for its geological importance. The Jurassic Coast charts 185 million continuous years of the history of life. MEMO will bring that record up to date, above ground, by the indigenous skills of Portland – the architectural art of the stonemason. The Jurassic Coast not only grounds MEMO within the conceptual territory of ‘world heritage’, but also, the story of modern extinction, within the vast narrative of the geological history of life.



above: Nicodemus' knob a column of stone on the east cliffs of Portland which was 'left' by the quarrymen to mark the original height of the island

left: United Nations Building New York which is faced with Portland stone

© Jeremy Edwards

Isle of Portland collection of Stuart Morris



# a place of discovery

The very idea that species could go extinct was first deduced from Portland fossils after Christopher Wren had chosen Portland stone for the rebuilding of London's public buildings following the Great Fire of 1666. The discovery was made by Wren's great collaborator, Robert Hooke, the Surveyor of the City of London. Like Wren, Hooke was a pioneer scientist of the nascent Royal Society as well as an architect.

The giant ammonites commonly found in Portland stone were so large, said Hooke, so unlike any living species, that they must be the remains of species 'totally destroyed and annihilated'. His discovery of ancient extinction on Portland was made just as the dodo was dying out on Mauritius, the iconic and among the first of the extinct species on the Red List.

## restoration and regeneration

Despite centuries of extraction, Portland's quarries are pregnant with the potential for natural renewal. The island is internationally important for limestone plants, lichens, butterflies and especially birds. The building of MEMO

MEMO exhibition at St. Paul's Cathedral 2009



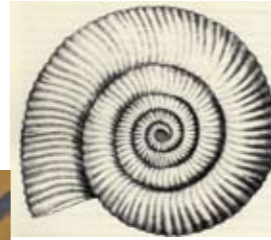
Portland quarry



top right: Guillemot, Portland cousin of the extinct Great Auk which also used to nest on the island's cliffs © Ken Canning

below: art and science – the stairwell in the Monument to the Great Fire of London designed by Wren and Hooke to house a 200ft zenith telescope

right: Titanites giganteus as drawn by Martin Lister FRS, 1693



“The potential cultural, economic and educational benefits are huge.” Tom Grainger

outgoing CEO, Weymouth and Portland Borough Council 2010

will entail ten acres of quarry being permanently restored to species rich limestone grassland to form part of the coast-to-coast 'Portland Quarry Park'.

MEMO is a global monument with authentic local roots. Portland and its people have given much in the service of architecture; six million tonnes have gone to London alone. MEMO will be a great work of architecture to be retained by the island. Operating as a visitor attraction it will transform tourism locally by attracting new visitors and creating permanent jobs while showcasing Portland's proudest stonemasonry traditions.

left: blocks, quarried, squared up, but never used for the rebuilding of London East Weares, Portland



a turreted gastropod the Portland Screw

## an iconic structure

Set into the stony ground of the island, David Adjaye's design is inspired by a second characteristic fossil found there: the Portland Screw. A 'turreted' gastropod, this is a creature with architecture built into its very biological description. The image is of a great spiral of stone growing out of the cliff.

The floor of the monument is accessed via a 'cut' and finally a tunnel into the ground. Inside is a continuous spiral walkway, lined with the carvings of the extinct, linking Earth to sky, wrapped around a great central space. In the middle of the floor will be the bell facing an 'oculus' of sky above.

The walkway spirals up at disabled access gradient towards, and ultimately right through, the oculus to a colossal sea view and Chesil Beach stretching away into the distance. At 21m above ground, the height of the monument marks the same dimension removed below ground by quarrying. An exterior ramp winds down to the education centre which is built into the ground in order to maximize the area of restored landscape.

below: 'before' and 'after' site plans of Bower's quarry showing area to be restored to limestone grassland

right: section through MEMO © Adjaye Associates



“ Beautiful, I love the way it seems to spiral out of the cliff.”

“ Its local and international nature is the very kind of project Portland needs.”

“ Economic benefit plus a sense of pride.”

“ Marvellous idea. As a Portlander, very proud to have it here.”

Written feedback from public consultation on Portland, April 2011. The Project received 95% approval ratings.



“The current loss of biological diversity on Earth is one of the greatest crises of our time with profound long-term consequences for mankind. One of the reasons that it continues unabated is a lack of public awareness of the issue and the value that biological systems provide including everyday fundamentals like fresh air, clean water and fertile soil. We urgently need to rectify this. And that is why MEMO is so important to the world. Combining art, science and public participation, MEMO is a truly unique educational tool of global significance.”

**Ahmed Djoghlaif**

*Executive Secretary of the UN*

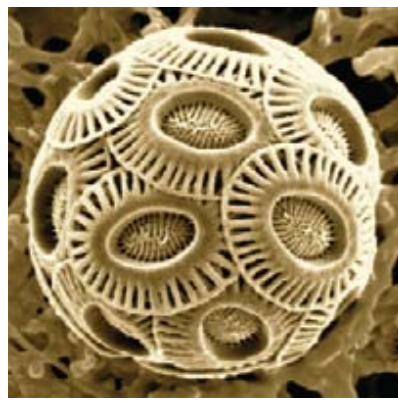
*Convention on Biological Diversity*

left: Edward Norton, UN ambassador for Biodiversity with MEMO bell New York 2010

right Harry Brockway carving the endangered Pink seafan the Lyme Regis Fossil Festival 2010







limestone is created by life:  
*Emiliana Huxleyi* the plankton  
species responsible for most  
limestone precipitation today

# education

From the Paleolithic caves to Disney and Dreamworks, we have been telling animal stories forever. Especially to children.

The stories of the extinct bear witness to exactly the same threats now faced by endangered species and those who seek to conserve them. The dodo tells of invasive species; the Bali tiger of habitat loss; the passenger pigeon, overharvesting and the golden toad, climate change. Meanwhile species like the gastric brooding frog illustrate the implications of biodiversity loss for biomedical research.

The conservation solutions to biodiversity loss will be explained and the success stories will be told – like that of Przewalski’s horse which was reintroduced into the Mongolian steppe in the 1990s. And the sheer mysterious beauty of our fellow creatures – the original inspiration of all the arts – will be explored along with our myriad ecological, economic and cultural connections.



far left: stonemason  
Anthony Denman teaching at the  
MEMO festival Portland 2008

left: Bell for Biodiversity  
Royal Manor Arts College,  
Portland 2009



the extinct passenger pigeon  
*once the most populous bird on Earth*



cave painting Lascaux, France

“I went home and showed all my fossils I found to my family and told them that I carved on a massive block to go on an island and it’s going to stay there forever.” **Isabelle**  
*Feedback on MEMO activities on Schools Day at the Lyme Regis Fossil Festival, 2010*

“Some ‘difficult’ students suddenly became engaged in the stonework and stayed at lunch and after school. The presence of MEMO has been brilliant.”  
**Non-teaching member of staff**  
*Feedback from MEMO residency at Royal Manor Arts College, Portland, 2010*

Robert Hooke, human head louse  
*Micrographia* 1665



MEMO at the Lyme Regis Fossil Festival 2009

The site frames the subject within the vast geological picture, within the narrative of scientific discoveries of the early Royal Society and the story of the rebuilding of London. The architecture itself will provide many creative teaching opportunities from the lichens that will grow on it to the role of limestone deposition in the global carbon cycle. Like all limestones, Portland, both stone and island, is largely comprised of the bodily remains of ancient creatures.

The on-site education programmes will mobilize stone carving and all the arts to interpret the science for all ages. Schools parties will carve patterns based on the forms of micro-organisms and the geometry of organic growth, while all visitors will be invited to mark their visit – and make their mark for biodiversity – by carving their initials beneath a (yet to be revealed) inscription: the Portland Memo.



above: MEMO Residency in Portland schools 2010 extinct/endangered Janus-head masks at Underhill Primary

### residencies in schools

Making the necessary carvings will involve both the training apprentices on Portland and international carving festivals, but many of the carvings for the monument will also be created in artist's residencies in schools all over the world. In a pilot at Royal Manor Arts College on Portland, we found biodiversity so fundamental that it migrated quite naturally across subject boundaries. Each residency will include the making of a sculpture of an endangered species to remain in – the species to be selected, researched and ultimately 'adopted' by – the school community in which it was made.

“...the Earth it self, which lyes so neer us, under our feet, shews quite a new thing to us, and in every little particle of its matter, we now behold almost as great a variety of creatures as we were able before to reckon up on the whole Universe it self.”

Robert Hooke on putting a speck of stone dust under his microscope and discovering the form of a seashell: *Micrographia*, 1665



the extinct golden toad



Miranda Richardson ringing a Bell for Biodiversity *St. Paul's Cathedral, Biodiversity Day 2009*

## the big bell

In order to make all future extinctions audible as well as visible, in the middle of the monument will be a great 'geological' bell to be tolled whenever another species goes extinct. Following the success of a final scale model cast at Taylor's Bell Foundry in Loughborough in February 2012, it will be cast the Bronze Age way - from a stone mould. In particular it will be cast from 'roach', the youngest of the Portland strata which is riddled with the fossil hollows of Jurassic shellfish.

Upside down, Earth mounted, with mouth facing the sky, it will be nearly 10 feet in diameter, the height of a basketball player, and weigh 9 tonnes. It will be cast at Taylor's within the original cast iron 'flask' which yielded *Great Paul* in St. Paul's Cathedral - the biggest bell ever cast in the UK. The connections with the City of London will be further cemented by naming the 4 foot diameter maquette in honour of 'London's Leonardo', Robert Hooke, who first alerted the world to the possibility of extinction. Hopefully it can be permanently sited in the City.

### bells for biodiversity

On 22 September 2010 our first experimental roach-cast bell was rung at the UN in New York as heads of state gathered to discuss biodiversity for the first



above top: first casting in a stone mould *Portland 2009*

above below: Marcus Vergette's 28 maquettes for the big Bell *Lyme Regis 2010*

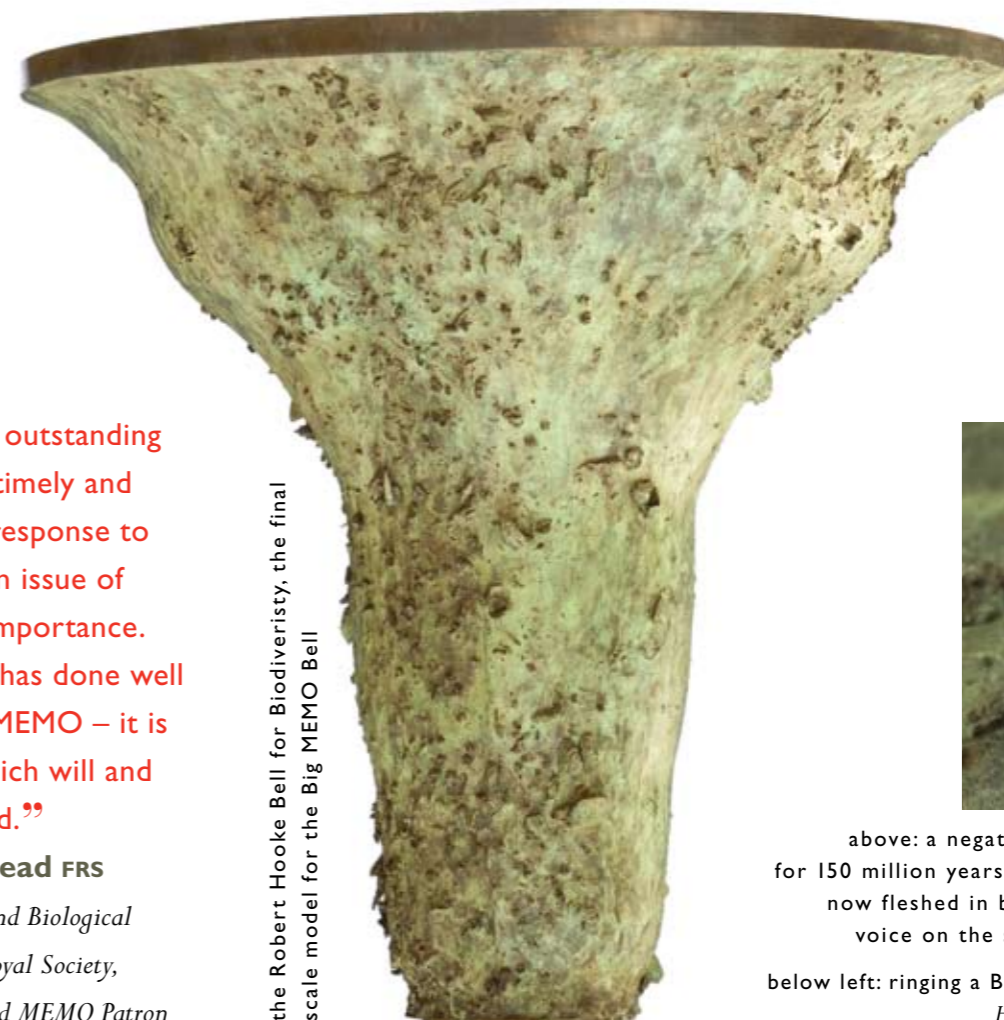
“MEMO is an outstanding project... a timely and imaginative response to addressing an issue of vital global importance. The Society has done well to endorse MEMO – it is a project which will and must succeed.”

**Sir David Read FRS**

*Vice President and Biological Secretary, the Royal Society, 2003-2008, and MEMO Patron*



the Robert Hooke Bell for Biodiveristy, the final scale model for the Big MEMO Bell



above: a negative shape in stone for 150 million years, a Portland Screw now fleshed in bronze and given a voice on the surface of the bell

below left: ringing a Bell for Biodiversity *Hindu temple 2010*

time. Hundreds of bells around the world were rung in concert with it that day.

Bells are for celebration as well as mourning and warning. They exist in all cultures and in everyday life – in schools, on ships, in farmyards and town halls, as well as churches and temples – the world over. As the International Decade on Biodiversity begins, we aim, with our international partners, to celebrate Biodiversity Day on 22 May each year, with a cacophony of such international bells.

# funding & business plan

David Adjaye has gifted his wonderful spiral design. The Crown Estate has granted a long lease on the spectacular site for a peppercorn rent. And the local authority has voted unanimously to grant full planning permission.

The total capital cost is £30 million. This includes construction, planning of the interpretative programmes, and setting up the necessary business infrastructure for operations. The business model describes a self-sustaining ticketed visitor attraction with a top entry price of £10. Visitor numbers to the site are projected at 300,000 p.a.

Phase I, including the development of both architectural design and business plan for the submission of the planning application, and proof of concept activities to test the project with both the public and with potential partners, has been successfully completed.

Phase II - the trustees are now actively seeking major grants and sponsorship partnerships for the construction phase. Naming opportunities from £500,000 - £10 million are available for segments of the buildings, collections of carvings, and other bespoke recognition of leadership support. With funding in place work on site could begin in Spring 2015.



above: West African Black Rhino  
by Joanna Szuwalska and  
Matt O'Donovan, Portland 2008



Phase III - the construction phase is estimated at 18 months until completion with opening day anticipated before the end of 2016.

**“I was deeply moved on learning of this brilliant, profound, and ultimately humanitarian enterprise. I believe it can be the seed and soul of a renaissance in public engagement with biodiversity.”**

**Professor E.O. Wilson, MEMO Patron of Harvard University, the ‘father of biodiversity’**

## sponsorship & funding

With planning permission in place, the trustees are now actively seeking major grants and sponsorship partnerships for Phases II and III.

- Naming opportunities are available for segments of the building, collections of carvings, education centre, or other bespoke recognition of leadership support.
- As a stone-carving project we regard the carved recognition of donors at the monument as a creative opportunity.

above: the 60ft high bamboo Portland Screw at Bower's Quarry built by the people of Portland using just bamboo and rubber bands to put down a marker for the MEMO Project at the time of the Olympics © Norman Lomax

# a geological moment

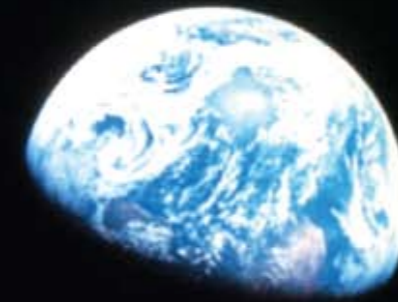
22 The web of life is the cradle of our species and remains our only conceivable home. Our instinctive wonder at it has been the well-spring of so much of both the arts and sciences since the beginning. Perhaps biodiversity is that rarest of beasts, a subject on which people around the world can unite.

Thanks to the early warning system that is science we are witnessing 'mass extinction' by rate – but not yet sheer scale. If 860 species have been assessed as extinct since the dodo, the more than 20,000 which have been assessed as endangered are still with us today. The ultimate goal of MEMO is to inspire their protection. A global symbol which combines all the soul of the arts with the authority of science can provide the kind of cultural lightening rod which the geological drama of the moment surely demands.

“As powerful and imperative as I believe the practical arguments for conservation are, a change in perception and value about our place in nature could achieve vastly more.”

Tom Lovejoy

Earthrise from the moon © NASA



“Halting biodiversity loss is the great challenge of the coming decade. It's on a par with putting a man on the moon... Like that first step on the moon, it would be a giant leap for mankind.”

Sir David Attenborough 2010

Part of that challenge now is to capture the public imagination.

## people and partners

Starting MEMO from scratch has involved many brilliant people. Wholehearted thanks go to our Founding Benefactors, Dorset County Council, the Worshipful Companies of Masons, and Management Consultants, the Weymouth and Portland Partnership, the Design Team, the Eden Project, Stone Firms and Albion Stone, the Crown Estate, staff and pupils at RMC, and to our myriad Partners, Patrons, Friends, and Volunteers.

endorsed by



### royal patron

HRH The Duke of Edinburgh KG KT

### patrons

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Professor James Lovelock FRS CH

Lord May of Oxford PPRS OM

Professor Sir David Read FRS

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### trustees

Daniel Brooke

Lord Brooke of Sutton Mandeville CH PC

Dame Julia Cleverdon DCVO CBE

Peter Cruttwell *Secretary and Treasurer*

Richard Fortey FRS

Peter Luff

Sue Lyons

Andy Matthews

Michael Murphy

Sir Ghillean Prance FRS VHM *Chair*

Rohan Silva

### design

Adjaye Associates *Architects*

ARUP *Engineering*

AECOM *Cost Consultants*

Mike Kelly *Planning*

Sebastian Brooke

*MEMO, Project Director*

Paula Ehrlich *E.O. Wilson Biodiversity Foundation*

Coe Design *Landscape Architects*

Marcus Vergette *Sculpture and Bell Design*

### advisers

Sir Tim Smit KBE *Principal Adviser*

IUCN Species Survival Commission *scientific advice*

Trowers and Hamlins *legal advice, construction*

Thorne and Co. *legal advice, property*

### partners

Albion Stone

City of London Corporation

The Crown Estate

Dorset County Council

Eden Project

Hay Literature Festival

International Year of Biodiversity, UK

Jurassic Coast Earth Festival

Jurassic Coast World Heritage Team

Jurassic Coast Arts Programme

Living Planet Foundation

Lyme Regis Fossil Festival

Portland Gas Trust

Portland Community Partnership

Portland Sculpture and Quarry Trust

Revive Portland

Royal Manor Arts College

The Royal Society

Sector Three Consulting

Stone Firms Ltd

St. Paul's Cathedral, Dean and Chapter

St. Paul's Institute

Take the Space Theatre Company

Underhill Primary School

United Nations Association, UK

UN Secretariat of the Convention on Biological Diversity

West Wales School of Art

Weymouth and Portland Partnership

Weymouth College

Worshipful Company of Masons

Zoological Society of London

### volunteers

Tim Abberley

Aosaf Afzal

Chris J Bailey

Jerome Bailey

Rachel and Roger Barton

Natalie Basrawy

Yvonne Bevan

Ian Bonny

Harry Brockway

Beatrice Brooke

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Camilla Bustani

Lorraine Camp

Chayley Collis and

Jonny Purkis

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Carl and Myrna Flew

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Paul Hyland

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Mike and Wendy Kelly

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Tim Lees

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Billy Lillywhite

Paul Lister

Peter Loizou

Norman Lomax

Jim Lovell

Nigel Miller

Stuart Morris

Jeremy Nichols

Tom Nichols

Sarah Nichols

Matt O'Donovan

Richard Paisley

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Roy and Sandra Pepperell

Jim Potter

Simon Reid

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Amy Shelton

Gavin Shelton

Callum Shone

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Hugh and Shirley Torrens

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Emma and Adrian Vickers

Darrell Wakelam

Nick Wheatley

Andrew Whittle

Will Whitby

Alex Wood

Emily Young

supported by



right: the Yangtze dolphin declared extinct in 2006 photo: © Nick Gordon design: chris j bailey ©2013

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“The MEMO Project should never have been necessary. But necessary it is, and I am glad to see human imagination involved in commemorating the diversity of life rather than diminishing it.”

Philip Pullman *MEMO Patron*



MEMO



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