

Winter June to August 2011

VOLUME
33
NUMBER
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explore

culture

WEAVING DREAMS AND TEAMS

nature

SAVING THE TASSIE DEVIL

people

MEET DR ELENA KUPRIYANOVA

discover

FROGS AND TOADS,
DISAPPEARING ROCK ART & MORE



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by DESIGN

Like Mark Twain's death, reports about the demise of printing have perhaps been exaggerated. While the trend is for electronic publications, we believe there is still a place for print publications such as *Explore* magazine and the new *Your events* calendar.

We are striving to be more sustainable in our approach while projecting the contemporary relevance of what we do at the Museum – not just through the stories in *Explore*, but through its look and feel too.

So, with those words of introduction, let me welcome you to your new-look, more sustainable *Explore* magazine. Have a read. Think about it. Tell us what you think.

WRAPPED

One of the stories in this issue highlights a remarkable collection of Aboriginal artefacts in the Museum's collection – the Morrison collection from the Hunter Valley (NSW).

Yet many Aboriginal treasures are held in museums outside Australia. One example is a possum-skin cloak held by the Smithsonian National Museum of Natural History (USA). Possum-skin cloaks were made in southeastern Australia at least until Europeans arrived, but very few remain. The Smithsonian cloak was collected by an American expedition in 1840 from 'near' the Hunter River. It is made of more than 20 possum skins (and one kangaroo skin) sewn together and highly decorated on the skin side. I don't think it's been seen in Australia since.

Fortunately the tradition of cloak-making is returning and you can see a magnificent new cloak made by the Lake Macquarie Aboriginal community in our exhibition *Wrapped in a Possum Skin Cloak by the Lake* (until 31 July, *Indigenous Australians*, Level G). See our website for more about the exhibition, possum-skin cloaks and the Morrison collection.

LIVING CULTURE

There is a larger point here: how people – locals and visitors – should be able to engage with Aboriginal cultures and see them from an Aboriginal perspective. We are at the start of a process to update our *Indigenous Australians* exhibition, and this process will enhance such engagement.

Yet many tourists arrive in Australia believing that the only living Aboriginal cultures are from northern or central Australia. So, in addition to the updated *Indigenous Australians* exhibition, Sydney needs a place where Aboriginal cultures can be expressed in a way that complements, and adds to, the more traditional, 'museum-like' exhibitions.

The Australian Museum is ideally placed to be a key part of such expression, utilising our staff, knowledge and collections, and working with Aboriginal communities. I'll keep you updated about both processes as things move along.

Meanwhile, I hope you enjoy the new *Explore*.

FRANK HOWARTH

Director of the Australian Museum



gems

ON DISPLAY

GEMMOLOGIST **GAYLE SUTHERLAND** HAS BEEN INSTRUMENTAL IN CURATING A NEW GEM DISPLAY THAT FEATURES SOME STUNNING EXAMPLES OF THE CUTTER'S CRAFT.

This page

Colour range of
Australian sapphires.
Photo Stuart Humphreys.

Opposite

Gayle Sutherland stands
by the new gem display.
Photo Carl Bento.

Opal replacement of
gastropod shell from
White Cliffs, NSW (top)
and chalcedony with
mineral inclusions
(‘moss agate’) (bottom).
Photos Stuart Humphreys.



Many Museum visitors sorely missed the *Gem Vault* when it was removed from the *Planet of Minerals* gallery to make way for a fire escape. However, at last we have some good news – the new gem display has been installed in the Mineral Gallery foyer (Level 1) and is attracting plenty of attention.

CONTRAST

The first step in preparing the new display was a cardboard mock-up of the showcase interior to show how many specimens could be accommodated. There was less space than in the previous display so choices had to be made.

I decided to show our largest, finest, most colourful gemstones, with a few crystals, and add contrast with polished pieces like the slice of moss agate, the opal cameo and precious opal fossils. The display contains approximately 200 individual items and small groups.

For a gemstone exhibit like this, strong overhead lighting is crucial. We decided to flood the case with light from above and keep all fittings white to avoid the deadening effect of a dark background. This lighting has made the most of the gemstones' colours.

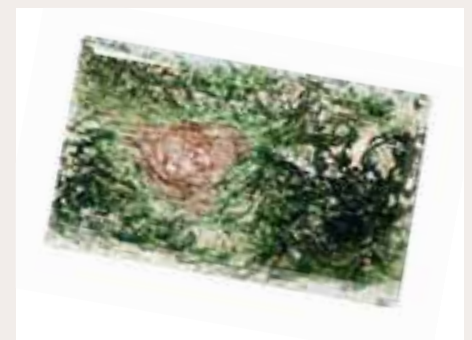
AGE AND BEAUTY

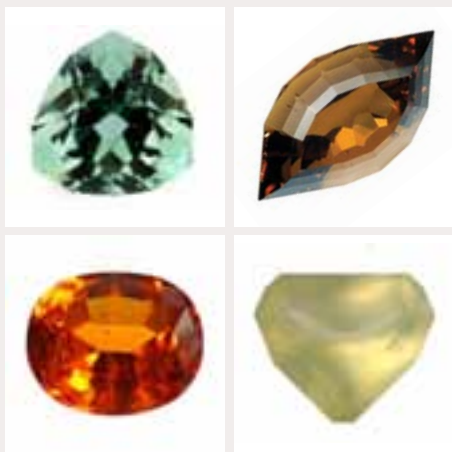
The Museum has a large and historic gem collection, of which about half is Australian material. It is considered the best public gem collection in the country. Some of the gemstones now on display were acquired in the nineteenth century, while others are more recent acquisitions.

The oldest is the group of diamond crystals from the Cape of Good Hope, South Africa, which entered the Museum collection before a separate register of minerals was begun in 1887. Diamonds were discovered in South Africa in 1866, so these crystals arrived here shortly after that historic discovery.

*“Yet the stones
I care for most are
those that hold
personal memories
for me and, oddly
enough, these
have cost the
Museum nothing.”*

GAYLE SUTHERLAND





Gems are measured in carats (ct), with five carats to the gram.

Clockwise from top left: Green fluorite from Emmaville, NSW (147 ct); 'eye cut' scapolite from Tanzania, Africa (97 ct); prehnite from Wave Hill Station, NT (40 ct); orange sapphire from 'Kings Plains', Inverell, NSW (3.5 ct). Photos Stuart Humphreys.

Bottom

This ring of sapphire, diamonds and platinum was a bequest to the Museum.

Almost as old are three fine quartz gemstones: an oval rock crystal, a round, orange-brown cairngorm and an oval amethyst. Their entry into the minerals register on 25 February 1895 gave no locality, but their beauty has survived the intervening 116 years and they are as displayable now as they were then.

TOPAZ AND OTHER FAVOURITES

Early specimens are also on display in the topaz section, including a large, blue-zoned stone registered on 28 February 1895 and some outstanding colourless and blue topaz from the Oban River (NSW) district, part of a sizable private mineral collection purchased in 1901.

The pink topaz from Brazil is from the same collection. Its bright pink colour, fashionable in nineteenth-century jewellery, was achieved by heating less valuable brown material.

Each gemstone has its own beauty so it is hard to pick favourites. I am particularly fond of the 'rainbow' of cut sapphires because it demonstrates the large colour range of sapphires from the Australian fields.

I admire the superb faceting of a number of unusual stones – the fabulous 'eye cut' scapolite from Tanzania, the translucent freeform prehnite from the Northern Territory and the green fluorite from Emmaville, NSW, a perfectly cut triangular gemstone. The latter was cut from material already in our collection by a great faceter, Maria Atkinson, who specialises in rare and difficult material. The result surpassed our expectations and produced a perfect Australian stone. I could go on.

IT'S PERSONAL

Yet the stones I care for most are those that hold personal memories for me and, oddly enough, these have cost the Museum nothing.

The Sri Lankan sapphire and diamond ring – a head turner if ever there was

one – came from a delightful French lady. I remember sitting talking with her years ago when she brought in some gemstones for identification. She was the sort of gentle, refined lady one does remember. Imagine our surprise when her solicitor told us that she had left the Museum a large and valuable sapphire ring in her will.

Another very special stone to me is the bright orange sapphire from 'Kings Plains', Australia's largest sapphire mine. A former owner of the mine kept the stone in his personal collection because of its rare colour. When I admired it and suggested lightly that he might like to donate it to the Australian Museum, he looked amused and said, 'It's too good for a museum'. So I was thrilled when he did donate it after all.

A large, green peridot intrigued our whole department when it was offered to us years ago at a price we could not afford. But we went into battle to raise money for the stone – one of the larger cut peridots in the world. We asked for donations and gave talks to raise the funds. Now the stone is here for all to see.

Perhaps these stories tell us something about gemstones. Although they are minerals, their beauty can affect us in a very personal way, as anyone who has ever owned a beautiful piece of gemstone jewellery can testify.

GAYLE SUTHERLAND TECHNICAL OFFICER, MINERALOGY

Gayle says: 'I'm always pleased to identify gemstones for Members and the general public (but I'm unable to offer valuations).

To make an appointment, just phone me on 02 9320 6240 during business hours, or send an email to gayle.sutherland@austmus.gov.au

WEBLINK ›

Got something to say about gemstones? Why not start a conversation at www.australianmuseum.net.au/Gems-on-display.

on the RECORD

New species are discovered more often in museums than in remote forests and ocean depths. Future issues of the *Records of the Australian Museum* will publish new species of beetles, spiders, flies, molluscs and frogs, all of which are represented by specimens carefully preserved in this museum.

FUNNEL-WEB SPIDERS REVISED

And you thought there was only one species of funnel-web spider! This new work completely revises the taxonomy of funnel-webs (sub-family Atracinae) to recognise 35 species in three genera. The author, Mike Gray, redescribes or diagnoses 14 previously known species and describes a staggering 21 new species. Proceed with caution.

Michael R Gray, 2010. A revision of the Australian funnel-web spiders (Hexathelidae: Atracinae). *Records of the Australian Museum* 62 (3): 285–392. doi: 10.3853/j.0067-1975.62.2010.1556

OUT OF THE FIRE

Obsidian (volcanic glass) is found in many parts of the world, and artefacts made from this material provide a window for archaeologists to view human cultures. Nina Kononenko's forensic examination of microscopic markings reveals how obsidian tools were used centuries ago, providing insights into the rich history of Melanesia and other cultures.

Nina Kononenko, 2011. Experimental and archaeological studies of use-wear and residues on obsidian artefacts from Papua New Guinea. *Technical Reports of the Australian Museum, Online* 21: 1–244. doi: 10.3853/j.1835-4211.21.2011.1559

PARASITIC WASPS SORTED

Certain beetle grubs are a major pest in sugar cane plantations but may be kept in check by parasitic wasps of the family Scoliidae. While one wasp might look much the same as another, not all species make effective biological controls of the grubs. With this paper, Michael Elliott brings order to the previous chaotic taxonomy of these wasps so that entomologists everywhere can know what they're dealing with.

Michael Elliott, 2011. Annotated catalogue of the Australian Scoliidae (Hymenoptera). *Technical Reports of the Australian Museum, Online* 22: 1–17. doi: 10.3853/j.1835-4211.22.2011.1562

If these highlights tickle your interest, you can find the whole story in the Museum's leading peer-reviewed scientific journals, freely available at www.australianmuseum.net.au/journalfinder.

SOLAR-POWERED LIZARD

The Australian Museum Lizard Island Research Station has slashed its fuel bill thanks to a new solar system.

'We used to run the diesel generator 24/7', said station director Dr Lyle Vail.

'But since we switched over to solar in February, we only need the generator for seven or eight hours a day – even when we're busy.

'So now we have silent, emissions-free power 16 to 17 hours per day.'

The system produces 30 kW and can store 288 kWh. It was funded by the Lizard Island Reef Research Foundation, Fred P Archer Trust and Abercrombie & Kent Philanthropy.

'We couldn't be happier with the new system', Lyle said.

Further reading

Follow the Australian Museum Lizard Island Research Station blog at www.australianmuseum.net.au/Life-at-Lizard.

HAVE YOUR SAY

Send your feedback about *Explore* magazine to the Editor at explore@austmus.gov.au with your name and contact telephone number. Contributions will not necessarily be published and may be edited for length.

Get the latest Science Bytes as they happen – now with RSS feed! Send an email with 'subscribe' in the subject line to sciencebytes@austmus.gov.au or visit www.australianmuseum.net.au/Science-Bytes.

your SAY

EXPLORE ONLINE?

Can I receive *Explore* magazine by email or view it online?
MN, via Museum website

Members receive *Explore* as part of their exclusive membership benefits. We place selected stories online (look for weblinks in this issue). You can also subscribe to *Your Events* and *Science Bytes* e-newsletters and a variety of other blogs, or follow us on Facebook and Twitter (see inside back cover). Have your say – what do you think?
The Editor

AGREED!

It is indeed an important role for cultural institutions to address contemporary issues [*Explore* 33(1), foreword] and I commend you on the role the Australian Museum is playing in this regard.
SW, Sydney, NSW

NEVER ENOUGH

Just got my *Explore* magazine from the mailbox. Even if it were a 500-page magazine I could never have enough :) Thanks!
AS, via Museum website

THANKS

Thanks for a great magazine.
CP, Wentworth Falls, NSW

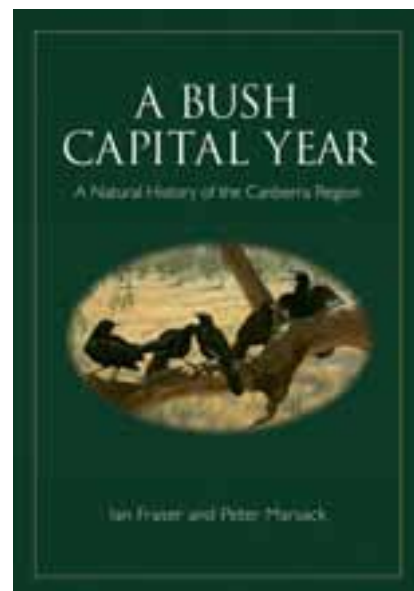
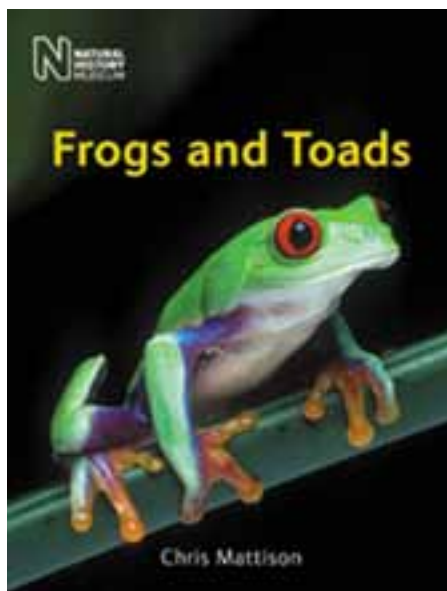
COLLECTOR'S CARD

The correct name for the Carpet Sea Star [*Explore* 32(4), p17] is *Meridiastra calcar*. It has not been *Patiriella calcar* for well over 10 years.
MB, Sydney, NSW

SORRY!

We apologise for the following errors that appeared in *Explore* 33(1) (autumn) on page 28:
Prof Tim Flannery has no Australian Government post-nominals (we mistakenly added an 'AM' to his photo caption.)
Prof Michael Archer is a member of the Order of Australia (we omitted to add an 'AM' to his name).
Prof Michael Good AO is at Griffith University, Queensland (not the University of Ballarat as stated).

The Editor



reVIEW

FROGS AND TOADS

by Chris Mattison
Natural History Museum, London,
UK, 2011

At first glance, *Frogs and Toads* may seem like just another glossy wildlife book.

And, yes, the book does have some truly stunning images of frogs. Further exploration, however, reveals that the photos illustrate a huge amount of content about rare or novel species, interesting frog behaviours and their unique adaptations. The book has a global coverage of species and Australian frogs are well represented.

The text assumes no prior knowledge of frogs, yet is detailed enough to satisfy even the expert. The broad topics include the origins, classification, diversity and biology of frogs, along with their relationships to people. The latter briefly covers declining amphibians and is the only section I would have liked to see expanded, given the dire state of amphibians globally.

Overall, I would highly recommend this visually stunning and informative book for anyone interested in frogs.

JODI ROWLEY SCIENTIFIC OFFICER

A BUSH CAPITAL YEAR

by Ian Fraser & Peter Marsack
CSIRO Publishing, 2011

Naturalist Ian Fraser outlines his view of Canberra's flora and fauna in this excellent book.

Each short story about the species and habitats in Canberra are no more than two pages and are organised by season, as the book title suggests, many illustrated with beautiful paintings by artist Peter Marsack.

The book is not a field guide as such and has little about how to identify plants and animals, but this limitation is partly offset by the paintings. The author describes what the plants and animals were doing when he found them, which is exactly the sort of information naturalists want, but rarely find, in a book.

Not all flora and fauna is included, and the author seems to emphasise birds, but there's enough of the less obvious wildlife and plants to keep it varied and interesting.

I'd recommend this book to anyone with an interest in the natural history of the Canberra region.

MARTYN ROBINSON NATURALIST

AT SEA

*with
Elena*

ARRIVING FROM YOKOHAMA,
JAPAN'S SECOND LARGEST CITY,
LAST NOVEMBER, **ELENA KUPRIYANOVA**
IS THE LATEST RECRUIT TO THE
RESEARCH ARM OF THE MUSEUM.



Above left

This serpulid is found only on living corals but scientists do not fully understand this symbiotic relationship. Photo © Christophe Pichon.

Above right

Some serpulids are known collectively as Christmas tree worms because of their crown of spiralled branchia [gills]. This worm, *Spirobranchus* sp., is extending its fan to collect food but can quickly withdraw into its tube when threatened. Photo © Christophe Pichon.

Left

Elena Kupriyanova. Photo Stuart Humphreys.

“It’s my Mount Everest – I do it because it’s there.”

ELENA KUPRIYANOVA

Elena Kupriyanova describes her new role as an ‘integrative systematist’.

‘It basically involves bringing together studies from different angles, such as taxonomy, molecular biology, ecology and biogeography, to work out the relationships between animals’, Elena said.

She specialises in the Serpulidae, a well-known and widely distributed family of marine tube worms that play key roles in marine ecosystems.

‘The serpulids include some fascinating and beautiful animals which live in small tubes made of calcium compounds.

‘They’re found in nearly all marine environments, from intertidal areas – where they avoid predators and drying out by withdrawing and plugging their tube with an operculum – right down to the ultra-abyssal depths of the oceans, where they’ve been recorded from trawls at more than 9700 metres!’

BLACK SEA, WHITE SEA

Elena became interested in serpulids at Moscow State University where she studied in the 1980s.

‘Why study marine biology in landlocked Moscow? It goes back to my childhood summer holidays at Black Sea resorts and then work at the university’s White Sea field station at the Arctic Circle.

‘I began working on them for a term project which eventually became a thesis and then a whole chapter in a book about the polychaetes of the Arctic Ocean’, she said.

‘Going back even further, I knew by the age of seven that I was going to be a zoologist and declared as much to my parents, who weren’t really that surprised ...’

She went on to complete her doctorate on marine worms and has worked on them ever since.

INTO THE LIGHT

So what does the immediate future hold for Elena at the Museum?

‘In Sydney I will be discovering and describing new organisms from both old collections and fresh material. The existing collections from the darkness of the deep sea need to be brought to light, so to speak – many are just stored waiting to be described and shared.

‘The results from my work will be used to advance our knowledge of general biology and answer taxonomic questions about phylogeny and diversity. But mainly I’m curious to find out more about the diversity of the ocean.

‘It’s my Mount Everest – I do it because it’s there.’

BRENDAN ATKINS EDITOR



This spread

Spears, clubs and boomerangs from the Morrison collection.
Photos Stuart Humphreys.

Far right

Wonnarua man Laurie Perry.
Photo Finton Mahoney.

the **BOOMERANGS RETURN** *reinvigorating Wonnarua culture*

A COLLECTION OF ABORIGINAL ARTEFACTS DATING TO THE NINETEENTH CENTURY IS A RECENT ADDITION TO THE MUSEUM'S 'VIRTUAL' COLLECTIONS.





People from the Wonnarua nation, in the Singleton area of the Hunter Valley (NSW), have maintained a strong sense of cultural identity despite the impact of European settlement on their traditional lands and culture.

And they're continuing to reinvigorate their traditional culture, says Wonnarua man Laurie Perry.

'Well, at the moment, the Wonnarua Nation Aboriginal Corporation ... we have actually developed the Reclamation Committee to look at getting our information back and putting it onto our website', Laurie said.

BOOMERANGS

Of particular interest is a collection of 124 Aboriginal cultural objects put together by Alexander Morrison, a publisher and collector in Singleton, between 1893 and 1910.

'Seeing the objects today gave me a great sense of ownership; the collection to me is very important to our people', said Laurie.

Morrison occasionally employed people in his printing works from nearby St Clair Mission, which was established in 1893 as a mission for the displaced Wonnarua people.

Many of the objects in this collection were made for Morrison by Wonnarua people at the mission.

'A part of the collection comes from the St Clair area and other parts are from other areas around Australia', said Laurie.

'The St Clair Mission is important to the Wonnarua people. It's a belt of land that we own just on the outskirts of Singleton in Carrowbrook.

'To me the collection signifies that there is a greater understanding between the Aboriginal people, the traditional owners, the Wonnarua people of the area.'

The corporation is also developing a master plan that will see a cultural park created at the old mission site for interpreting Wonnarua culture, language and history.

'We're looking at working in partnership with the Australian Museum to reclaim our culture and heritage and our history.'

ACCESS

Providing access to the collections is one way in which the Museum supports the Wonnarua people and other cultural groups in meeting their aspirations.

'The Morrison collection is important because it shows that Indigenous people were prepared to participate in the wider economy, making and selling cultural artefacts', said Phil Gordon, Indigenous Collections Coordinator.

'The Museum has always provided access to the collection for those who want it and now of course we're making greater use of the internet.

'With the approval of Wonnarua representatives, we've photographed the entire Morrison collection and made it available online.



'It's a great way for people to access these objects because we just don't have the physical space to display more than a tiny fraction of the cultural collections.'

BRENDAN ATKINS,

WITH ACKNOWLEDGEMENT TO FILM MAKER FINTON MAHONEY AND FORMER COLLECTION OFFICER ANNA GRAY.

The Morrison collection project was supported by the Indigenous Culture Support Program, Department of Environment, Water, Heritage and the Arts.

WEBLINK >

Visit the Morrison collection online at www.australianmuseum.net.au/The-Morrison-Collection.

NAIDOC week celebrates the history, culture and achievements of Aboriginal and Torres Strait Islander peoples. Visit the Museum from 3–10 July to be part of this year's theme, *Change: the next step is ours*.



dream

new to the collection



NEW TO THE COLLECTION ARE THESE *KETE* – HANDWOVEN BAGS CREATED BY MAORI PEOPLE USING FLAX, SKILL, KNOWLEDGE AND WISDOM, EXPLAINS CULTURAL COLLECTIONS COORDINATOR **DION PEITA**.



This spread and overleaf
Examples of kete (woven baskets) by artist Lisa Ward.
Photos Stuart Humphreys.

Ko tau rourou, ko taku rourou, ka ora ai te Iwi

(Maori proverb: with your contribution, and my contribution, success is assured for all).

Examples of Maori containers and handwoven bags (kete) in the Museum's collection provide us with an opportunity to explore traditional Maori weaving technology and practices.

The oldest example was collected in 1892, and was kindly donated by Mr Cavendish Liarder. Later examples were added in the 1970s by the Mechanics Institute Museum, Hamilton (NZ) – an organisation credited as a forerunner of public libraries in the region.

NEW THREADS

With only a limited sample of just 12 Maori bags in the Museum's collection, we wanted to add some contemporary examples and illustrate the continuity of artistic and cultural traditions. Local Maori community members after visiting the collections asked for contemporary pieces of weaving to be added that would inform their own kete-making practices. The Cultural Collections team took on the challenge to identify Maori weavers best placed to supply such examples. Supported by the Gwendoline A West bequest, we were able to commission New Zealand artist Lisa Ward, who has tribal affiliations which include Ngati Porou, Te Arawa and Ngati Awa.

The commissioned collection comprises kono (food baskets), kete whakairo (ornately patterned bags) and kete mahi (everyday bags). The most basic raranga design, takitahi, describes the technology of making the design – 'over one, under one' – to form a distinct checkerboard pattern when coloured strips are woven into the work.

WEAVERS



In a modern sense, the kete enables a traditional practice to be meaningful for contemporary communities by rejuvenating their tribal knowledge ...

The Pacific Collection

There are approximately 60,000 objects in the Australian Museum's Pacific collection, the largest collection in any Australian public museum. Included are 966 objects local to New Zealand, predominantly Maori cultural material. These are the result of intermittent cultural exchanges between early explorers, collectors and traders in Poi Hakena (or Port Jackson, as it was known to early Maori travelling to Sydney around 1800).

AN INSIGHT

From a Maori perspective the kete lends itself to many cultural narratives as a receptacle of knowledge and wisdom. This ancient depiction is contained in the story of how Tane Mahuta, the God of Forest, obtained for all of humankind the three kete of knowledge from Io, the supreme spiritual being.

This important cultural understanding applies to the term for leader, *Rangatira* (ranga, to weave; tira, a group). So a leader in a Maori context must have the ability to negotiate collective concerns and aspirations. In a modern sense, the kete enables a traditional practice to be meaningful for contemporary communities by rejuvenating their tribal knowledge of kete, from the gathering of raw materials to their production, use and purpose.

A GIFTED TALENT

Lisa is a skilled contemporary Maori weaver, acclaimed in Aotearoa, NZ, and internationally. Her weaving integrates traditional and contemporary processes into modern works. She was tutored by Sarni Scott from the Te Arawa tribal confederation in NZ; Sarni is a master tutor from Te Wananga o Aotearoa, an Indigenous NZ tertiary institution. Lisa's recent works are in keeping with strong cultural and spiritual origins which display artistry, complexity and colour.

'Weaving, however, is the easy part – 99 per cent of the weaver's mahi (work) is in the preparation', Lisa said. 'My perception of raranga is not only to carry on this practice, but also ensure tikanga (customary concepts) and kawa (protocols) associated with the harvesting and preparation of harakeke (flax) are strengthened. If we want this art form to survive, we must learn not only the practical side, but the spiritual side also.'

Weaving has been Lisa's life and in the last 10 years she has shared her experiences and artwork nationally and internationally through workshops, commissions and exhibitions. She has exhibited a number of her works at Te Wananga o Aotearoa recently, and at the Museum of New Zealand Te Papa Tongarewa. Lisa's work can also be found in collections across Australasia.

The Cultural Collections team hopes to bring Lisa to the Australian Museum to illustrate her work practice during public programs and build on the intangible heritage of this collection.

The Museum is delighted to acquire this collection of kete from Lisa to enhance both the collection and our aspirations for community engagement.

DION PEITA CULTURAL COLLECTIONS COORDINATOR

WEBLINK >

Who was Gwendoline West? Find out at www.australianmuseum.net.au/history-of-a-bequest-Gwendoline-West



search > DISCOVER



Q. What do Crucifix Frogs eat?

The wild diet of the Crucifix Frog, *Notaden bennettii*, consists of small black ants, termites and small insect larvae. For the baby frogs on display in *Search & Discover* we trap hundreds of ants each day to keep them fed. The frogs also have a taste for baby crickets, which can be ordered in. This is especially important during the colder months when ants are less active and harder to trap.

CHRIS HOSKING INTERPRETIVE OFFICER

The Crucifix Frog is named for the distinctive X-pattern on its back. It is sometimes confused with a toad because of its rotund body shape and short legs. The frog secretes a sticky substance to repel predators and buries itself in arid and semi-arid areas to wait for rain.

Caption Jodi Rowley. Photo Stuart Humphreys.



Q. Do we have any native rats in Australia?

It might surprise you to hear that around 20 per cent of Australia's 360 or so mammal species are rats and mice (rodents). Of these rodents, three have been introduced to become widely established.

Unfortunately, it is these three – the Black Rat, *Rattus rattus*, Brown Rat, *Rattus norvegicus*, and House Mouse, *Mus musculus*, that get all the attention!

Apart from the Bush Rat, *Rattus fuscipes*, and Water Rat, *Hydromys chrysogaster*, native rodents are rarely seen. However, for these introduced species, conditions in the city are ideal, making them much more common and visible.

SOPHIE MASTERS INFORMATION COORDINATOR

WEBLINK >

Visit www.australianmuseum.net.au/Bush-Rat.

Bush Rat, *Rattus fuscipes*. The Bush Rat has a number of key features that help to distinguish it from other rats or marsupials. Photo GA Hoye.



Q. I found this beetle and wonder if it might be an introduced species?

You have found one of more than 225 native species of aquatic diving beetle. They can fly at night to find water and are also attracted to light. We have received a number of enquiries and specimens recently, and we're keeping them alive in a small tank in *Search & Discover*. They need to breathe air, and they feed by biting into, and sucking the juices from, their prey (small fish, tadpoles and aquatic invertebrates).

STEVE VOGEL INTERPRETIVE OFFICER

WEBLINK >

Visit www.australianmuseum.net.au/Three-punctured-Diving-Beetle.

The Three-punctured Diving Beetle, *Cybister tripunctatus*, is a voracious predator of small aquatic animals. Photo Andrew Donnelly.

Send your query to the *Search & Discover* team, email sand@austmus.gov.au

the COLOUR PURPLE

Making a selection from the *Up Close & Spineless* competition is always exciting, and sometimes daunting, because there are just so many great images to choose from.

This year I found myself drawn to two images in particular, not just because of their photographic excellence but because of the vibrancy of their colours. Both of them contain the colour purple, which stood out quite dramatically to my eye. Purple is an interesting colour – the strong mix of a warm colour (red) and a cool colour (blue), it has the properties of both.

CATE LOWE PHOTO EDITOR

WHY CLICK?

Why do digital cameras and mobile phones click when you press the shutter, even though they're electronic?

You can ponder that question while you prepare to shoot a winning image for the 2011 *Up Close & Spineless* competition, which this year celebrates its 10th anniversary.

Up Close & Spineless challenges you to capture a spectacular photograph of an invertebrate animal (one without a backbone).

It's open to everyone – enter in one of four categories: Professional, Open, Primary and High School.

Finalists win everlasting fame by having their work displayed in the Museum, while winners each receive a cash prize of \$600.

For conditions, judging criteria and online entry, go to www.australianmuseum.net.au.

**Entries close 9 September 2011.
Happy shooting!**

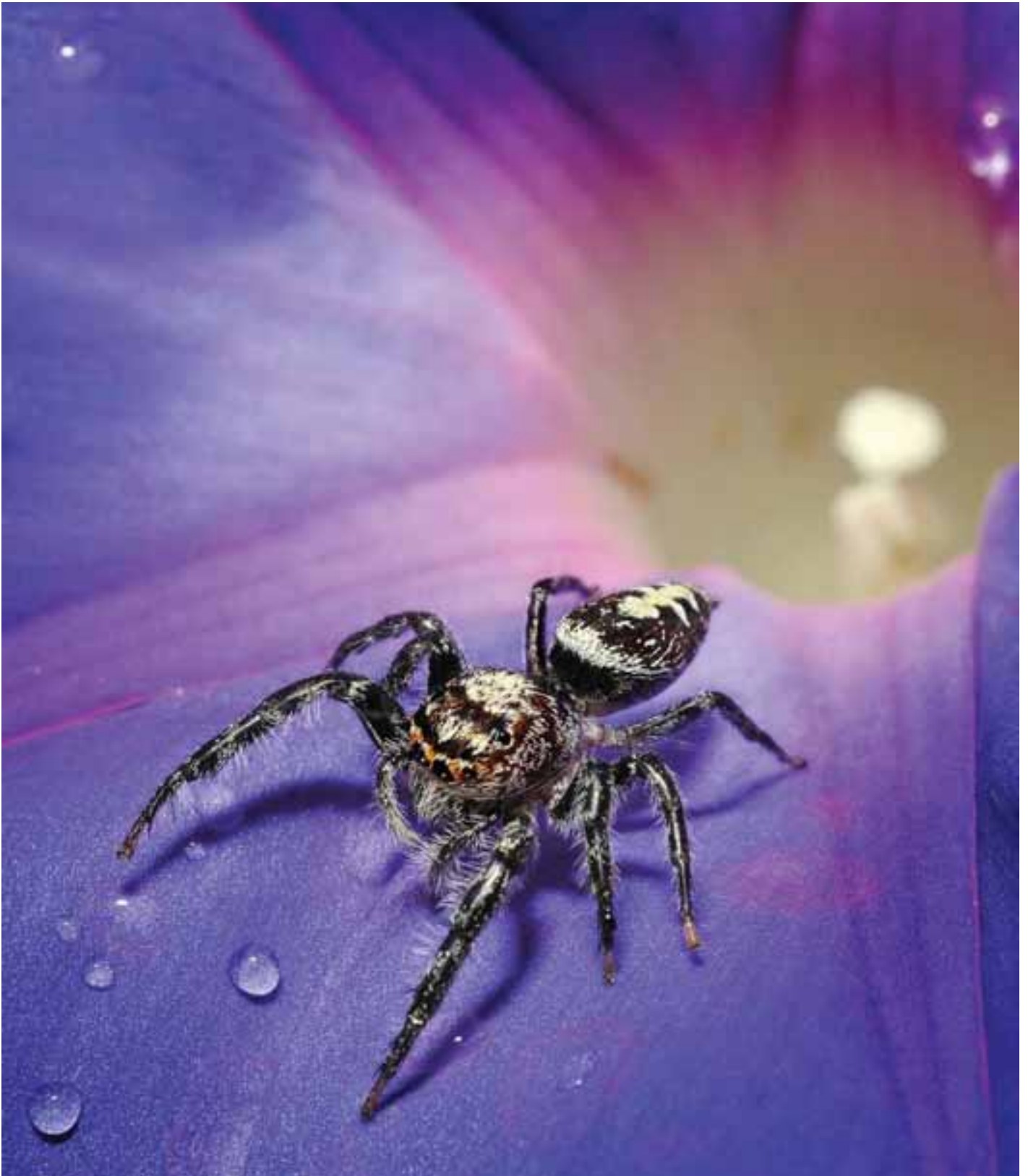


Above

Fire Urchin Shrimp (finalist). This is the Fire Urchin Shrimp, *Periclimenes colemani*. The shrimp lives on top of the Fire Urchin, carving out a home by removing the venomous spines to make a little patch to live. The image was taken in Tulamben, Bali. Photo © Chris Holman.

Right

Purple Rain. After some huge rain in our backyard my five-year-old son, Tom, and I ventured out for a macro session. Tom stumbled across a wonderful jumping spider (family Salticidae) on a tibouchina flower. The first thing that popped into my mind was the song *Purple Rain* by Prince. Photo © Timothy Poulton.



MARTYN ROBINSON
IS THE MUSEUM'S
RESIDENT NATURALIST

HERE THEY COME!



Cane Toads –
in your backyard?
Photo Jodi Rowley

The Cane Toad invasion has finally reached Sydney!

Cane Toads, *Bufo marinus* (now renamed *Rhinella marina*) have been arriving in Sydney for years but without establishing a breeding colony – until now. Why this has happened recently we don't fully know.

BREEDERS

In the past, healthy adult Cane Toads have been found in all seasons, so the relatively cold climate of Sydney was never enough to stop them. Alarm bells began to ring some time ago when a calling male was heard at Castle Hill and toad spawn found at Gosford – so breeding attempts were made, unsuccessfully we hope.

More recently, breeding Cane Toads were discovered in Port Macquarie, which was regarded as their most southerly limit – until more than 200 were found at Taren Point, south of the Sydney CBD.

The Taren Point Cane Toads were of mixed sizes, including some quite small ones, indicating that they had bred there rather than hitching a ride from the north. Is this related to our changing climate? Possibly, but we don't know yet.

Scientists have since used a radio-tracking device to find the colony's breeding ground and taken steps to bring them under control.

WHAT TO DO

So what can we do to prevent Cane Toads from establishing in Sydney?

First, we must be vigilant and contact the relevant authorities if we find any suspected Cane Toads so that we can slow or halt their spread south.

What we must *not* do is kill suspected Cane Toads. Unfortunately, it can sometimes be difficult to tell the difference between a Cane Toad and a native frog.

The Frog and Tadpole Study Group of NSW and Museum staff have often been asked to collect suspected Cane Toads from people's yards, and the most common misidentification is ... the Eastern Blue-tongued Lizard! (You'd think the tail was an obvious clue!)

IDENTIFICATION

I have also seen mummified frog bodies, plastic frogs, and all manner of native frog species misidentified as Cane Toads, and some of our local frogs – including at least one endangered species – have a very toad-like appearance. Both in Sydney and elsewhere, many harmless native frogs have been killed mistakenly for Cane Toads.

So, if you think you have a Cane Toad, catch it and take it alive to your local National Parks and Wildlife Service office or to the Museum, or email us a photograph of it. We can then identify it as either a Cane Toad or a native species. Clumps of frog spawn in strings like beads are typical of Cane Toad eggs, and a photo will help to identify them too.

WEBLINK >

Find out more about Cane Toads at
www.australianmuseum.net.au/Cane-Toad.

BAD HABITS



Common Methana
Cockroach, *Methana
marginalis*.
Photo © Nick Monaghan,
lifeunseen.com

When most of us think of cockroaches we think of a limited number of species – mainly the ones we’ve found in our homes.

Luckily there are many other cockroach species which never cause trouble and live outside. These species would most likely starve in a house where suitable food – usually dead leaves, pollen, bark or fungus – was not available.

TRAVELLERS

Introduced cockroaches eat pretty much what we eat. That is why they live in our houses and why they have been transported around the world with us. They are often named from the last port of call before they entered the UK, rather than from their actual country of origin, so we have the American Cockroach, *Periplaneta americana*, Oriental Cockroach, *Blatta orientalis*, and German Cockroach, *Blattella germanica*.

Others, such as the Smokey Brown, *Periplaneta fuliginosa*, and Brown Bandit, *Supella longipalpa*, probably came from South-East Asia. The Australian Cockroach, *Periplaneta australasiae*, doesn’t seem to be a native of this country either.

SURVIVORS

Cockroaches are supreme survivors and few places in the world don’t have them, either native or introduced. They are adaptable to changing conditions – especially the members of the family Blattidae to which most of the pest species belong.

But at least one of our native cockroaches is learning bad habits – *Methana marginalis*, native to coastal Queensland, was accidentally introduced to Norfolk Island where it has adapted to life in the

leaf axils of palm trees and other vegetation similar to its native habitat. From there, and with almost no competition, it has made its way into houses where it has been able to find enough food to thrive, and is now a widespread nuisance.

Until recently this cockroach has not been a problem in mainland Australia. Now, however, we often get reports of ‘strange, pretty winged cockroaches with their striped faces and cream borders’ being found inside houses as far south as Wollongong (NSW). Although most breeding seems to occur outside, in some instances young cockroaches have been found inside, suggesting that they could be breeding there too.

OUTSIDE IN

An unrelated species in the same family and which has a similar colour pattern, the Shining Cockroach, *Drymaplaneta communis*, is a wingless species now common in parts of Melbourne, the ACT and Sydney. Although it is mainly found outdoors, and seems to prefer its diet of leaf litter and decaying vegetation, it survives in houses for a short time.

Let’s hope that not too many of our native cockroaches take up the bad habits of the introduced ones. Still, at least the native ones are prettier.

WEBLINK >

Find out more about native cockroaches at www.australianmuseum.net.au/Native-Cockroaches.

MUSEUM CONSERVATION EXPERTS ARE USING THE LATEST LASER TECHNOLOGY TO HELP CONSERVE SOME ANCIENT ART IN THE SYDNEY REGION, SAYS **COLIN MACGREGOR**.

SAVE *the* ECHIDNA?



Take a walk through the bush around West Head in Sydney's Ku-ring-gai Chase National Park and you'll probably stumble upon the art of the area's traditional owners, the Gadigal people.

Among the rock engravings are stunning examples of fish, sharks, ancestral spiritual figures and an echidna, the likeness of which has been adopted as the Australian Museum's logo.

FIRST ARTWORKS

Carved into the sandstone surfaces, these ancient artworks were intended to be permanent features of the landscape, but there are clear signs that various weathering processes – bushfires; sun, rain and wind; plants; and mammal (human) footsteps – are taking their toll on the rock surface condition.

Details of the rock engravings are best seen in the early morning or evening light, when the sun is low in the sky. Such is the subtle, mottled appearance of the encrusted engravings that many visitors will walk past or even over them in broad daylight without noticing at all.

CONSERVATION CHALLENGE

Barriers, walkways and signage are in place for some of the engravings but have been damaged by recent bushfires, creating a challenge to protect the sites from unnecessary wear and interpret them for visitors.

With this in mind, Museum conservators, in collaboration with the National Parks & Wildlife Service (NSW) and the Metropolitan Local Aboriginal Land Council, are assessing the engravings' rate of erosion using laser scanning equipment.

HIGH-TECH SOLUTION

Laser scanning is potentially an exciting new breakthrough in the management and conservation of rock art. The scanner – for the geeks, a Konica Minolta Vivid 910 – accurately records the contours of the rock surface and engravings to create an accurate three-dimensional digital record. Following the initial scan, the site can be rescanned after a suitable period, perhaps two or three years, and the two scans compared.

Using computer software (first developed by design engineers to ensure that manufactured goods conformed to

original 3D computer models), the rate of weathering can be calculated and the remaining lifetime of the engravings determined by modelling.

ACTION

So in February this year it was time to haul the scanner and associated paraphernalia to the remote site in Ku-ring-gai Chase to record the initial scan.

A Museum team of archaeologists Val Attenbrow and Ngaire Richards, conservator Colin Macgregor and video cameraman Finton Mahony accompanied NPWS NPWS Aboriginal Field Officer Eric Keidge and scanning specialist Ben Tam to the site.

A small generator provided power while a portable computer controlled the scanner and stored the data. The scanner had to be operated within a lightweight plastic tent draped in black cloth to exclude the bright sunlight which can interfere with the recording.

The laser's low output appears as a thin red line moving across the target surface when viewed in the dark, much like a supermarket scanner reading a barcode at



Left

Conservator Colin MacGregor demonstrates the laser scanner at West Head, Ku-ring-gai Chase National Park. Photo Finton Mahoney.

Below left

This echidna rock engraving, about 90 cm long, provided the inspiration for the Australian Museum logo. Photo Stuart Humphreys and Carl Bento.

The image from the laser scanner shows the engraving in relief. Future measurements will enable weathering to be evaluated. Image Colin MacGregor.



the checkout, except here it is recording tiny differences in depth rather than just reading patterns.

The resulting image provides more than just a baseline for the future monitoring of erosion. It can be used in displays to highlight details in the artworks not readily visible in the real thing. The data can also be used to replicate the rock engravings for possible display in future cultural exhibits by loading the digital file into a specialist printing machine that builds a three-dimensional model using small jets of synthetic resin.

FOUNDATION

The Museum scanner, purchased with the generous support of the Australian Museum Foundation in 2008, has many other potential applications for conserving cultural objects. For example a laser scanner has been used to monitor the erosion of fossilised footprints at Lake Mungo National Park in southwestern New South Wales.

The scanner could also be used to record the designs on Aboriginal scarred trees, which age and decay more rapidly than

rock engravings. It is often inappropriate to remove the trees from their original locations, so laser scanning offers a technique for creating an accurate record for use in future displays, studies and replicas.

Similar work in New Zealand has produced remarkable results, clearly showing the embedded carvings in trees, free from the background visual noise of colours and textures.

The current trial scan of the echidna engraving could be expanded into a larger project to create baseline data on the condition of other rock engravings in the Sydney region. A unique rock art lyrebird (the bird on the NPWS logo) could be the next to be scanned. The results would enable better monitoring and conservation management of these irreplaceable sites.

COLIN MACGREGOR

MANAGER, MATERIALS CONSERVATION UNIT

Further reading

Val Attenbrow, 2010. *Sydney's Aboriginal Past* 2nd edition. UNSW Press, Sydney.



RACE *with the devil*

DR KATHY BELOV, PAST WINNER OF THE PEOPLE'S CHOICE AWARD, SPOKE TO
BRENDAN ATKINS ABOUT THE LATEST RESEARCH INTO DEVIL FACIAL TUMOUR DISEASE.



Receiving the Australian Museum Eureka Prizes People's Choice Award from actor Cate Blanchett in 2009 thrust Kathy Belov and the plight of the Tasmanian Devil into the public eye.

So far more than two-thirds of the world's Tasmanian Devils have been killed by Devil Facial Tumour Disease (DFTD), one of the few contagious cancers known.

'Winning the award made an amazing difference. It raised the profile of this terrible problem and captured everyone's attention. It seems like everyone wants to do something to help the devils', Kathy said.

GIRL POWER

Kathy is Associate Professor at the University of Sydney's Faculty of Veterinary Science where she leads a team of 17 female researchers – and one male.

She wears her success lightly but credits the Eureka Prizes with helping to get the message out.

'It gave me the confidence to speak out and approach high-profile people. There's been a huge outpouring of support for the devils.

'Jon English [musician] organised a series of fundraising concerts to support the research and breeding programs that various zoos have set up to breed disease-free animals in captivity.

'There's also the Devil Ark – a 200-hectare sanctuary at Barrington Tops (NSW) donated by the Packer family, where captive devils can roam freely and keep their natural behaviour', Kathy said.

UNDERSTANDING

Kathy's research has been crucial in understanding the disease and the reasons for its rapid spread: the genetic similarity of the tumours, their similarity to the devil's genes and the lack of genetic diversity among devils.

'We think the tumour arose from a single devil cell and so its genes are similar to the host's.

'We also know that devil populations have been decimated at least three times in the past, wiping out much of their genetic diversity and leading to inbreeding.

'The tumour is quite unique because it's contagious – an infected devil transmits the disease by biting another animal during their frequent disputes.

'The immune system of an infected animal doesn't recognise the tumour as foreign, so they are not rejected by the animal's immune system and it eventually succumbs to the disease.'

RESISTANCE

While DFTD continues its bleak progress across Tasmania, surveys have turned up

Opposite

Dr Kathy Belov with a healthy juvenile Tasmanian Devil.
Photo Steve Merinos
© Veterinary Science Foundation.

Flashback

Kathy receives the People's Choice Award from actor and former Museum trustee Cate Blanchett in 2009.
Photo Steve Lunam.



a small population of devils in northwest Tasmania which do not appear to be succumbing to the disease at the same rate as populations in the east.

'Their response to the disease is different, with less than 20 per cent of the population affected, compared with 80 per cent elsewhere.'

But there's a new twist to the tale.

'What interests me is that the tumour seems to be evolving. Our worst fear would be that it evolves immune evasion strategies, in the same way that canine transmissible tumour [one of the few other known transmissible cancers] has.

'If this occurs, we could lose not only the devil, but also see the disease jump the species barrier to other native mammals like the quoll.

'That is a scenario we must prevent at all costs, but it's a race against time.'

BRENDAN ATKINS EDITOR

Dr Kathy Belov speaks about her research into this deadly disease on Tuesday 28 June. Details and bookings: phone Members on 9320 6225 or visit the Museum website.

Voting in the Australian Museum Eureka Prizes People's Choice Award closes midnight Australian Eastern Standard Time, Sunday 4 September. See the Museum website for details and online entry.





Left

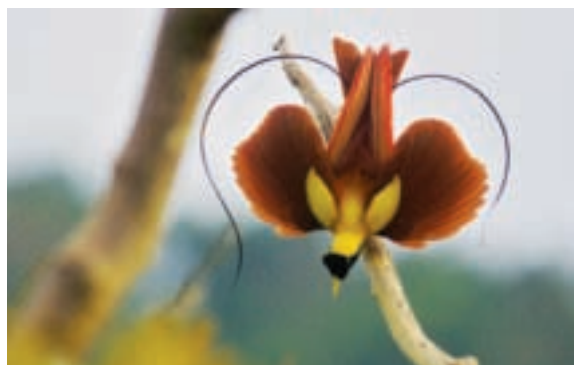
Blue Bird of Paradise,
Paradisaea rudolphi
© Tim Laman

Below

Red Bird of Paradise,
Paradisaea rubra
© Tim Laman

Wilson's Bird of Paradise,
Cicinnurus respublica
© Tim Laman

RITUALS OF SEDUCTION: *birds of paradise*



In the vine-tangled rainforests of New Guinea, Australia and Indonesia is a mating game like no other – that of the ostentatious birds of paradise.

Spectacular males dazzle hard-to-please females with moves reminiscent of modern hip-hop and plumage with all the flamboyance of a carnival float ... with a name like birds of paradise, you could be forgiven for thinking that they must have descended straight from an unknown realm, their hypnotic dancing and secluded tropical homes only fuelling the myth.

But, in fact, it is this isolation from the rest of the world that has allowed sexual selection to work its magic on these birds, morphing them into the strange and the beautiful.

This exhibition is an experience, an opportunity to see nature at its wildest and most unrestrained. Rare footage, unique photographs, engaging interactives and atmospheric design all conspire to give visitors a bird's-eye view of one of the world's most secretive seductions.

The photographs on these pages provide just a taste of the bizarre and beautiful wildlife that awaits you at the exhibition *Rituals of Seduction, Birds of Paradise*.

DEBORAH WHITE EXHIBITION PROJECT OFFICER

Rituals of Seduction, Birds of Paradise is open until 7 August 2011.

barcode breakthrough

A NEW TEST TO IDENTIFY PEST SPECIES BOLSTERS THE CASE FOR A REGIONAL DNA BARCODE LIBRARY, SAYS MUSEUM SCIENTIST **ANDREW MITCHELL**.

Detecting invasive insect pests is the first step towards better national biosecurity. But not all pests crawl or fly their way through Customs.

‘Several species of gypsy moth are major pests of forestry plantations overseas, and they can enter our ports as eggs on shipping containers’, said Andrew Mitchell, an integrative systematist at the Australian Museum.

LEG OR EGG

Gypsy moth species are naturally absent from Australia. The larvae (caterpillars) eat the leaves of trees and can devastate forests, native bush, crops and even street trees, according to AQIS, the Australian Quarantine and Inspection Service.

‘The egg masses are encountered regularly by AQIS officers’, Andrew said, ‘but of course eggs can’t be identified by morphology, so we need other diagnostic tests.’



Left

European Gypsy Moth, *Lymantria dispar dispar* adult. Photo © MG Pogue, USDA.

Below left

Japanese Gypsy Moth, *Lymantria dispar japonica* larva. Eggs of gypsy moths are often found on shipping containers in Australian and New Zealand ports. Photo © PW Schaefer.

Andrew and his colleagues in the NSW Department of Primary Industries, with overseas collaborators in Canada and New Zealand, have shown that DNA barcoding offers a rapid and effective way to identify gypsy moths from even the smallest amount of material, ‘literally a leg or an egg’.

‘DNA barcoding is a rapid method for identifying animals and plants by comparing tissue samples with DNA from a known source, usually held in a DNA reference library. This approach has been under-utilised but we’ve shown it would be more effective than current protocols for monitoring species of gypsy moth.’

‘The advantages of DNA barcoding include its sensitivity and flexibility’, Andrew said.

‘It can identify novel species (those not sampled when the reference library was developed) and incorporate them into the diagnostic method retroactively.’

SPECIES COMPLEX

Knowing which species is which is crucial for effective monitoring. In developing the reference library, only DNA from verified specimens – vouchers held in museum collections and identified by taxonomic specialists – can be used.

‘It was only when we started doing the genetic analyses that a new species of the moth was detected’, Andrew said.

‘This is significant because the adults are monitored using pheromone traps which are species-specific. If you don’t realise that a particular pest complex actually consists of two species you are likely to miss one of them when monitoring.’

REGIONAL COLLABORATION

Andrew wants to see greater collaboration in the Asia–Pacific region to control invasive pests such as gypsy moths by establishing a regional DNA barcode database for economically important species.

‘Australia is lagging behind other developed countries in this race to develop such databases, meaning that species of importance to us are not being sampled. We have to be more engaged with these initiatives to influence them and make sure that our interests and concerns are addressed’.

BRENDAN ATKINS EDITOR

[Dr Mitchell travels to Kuala Lumpur in June 2011 to present a paper at the South-East Asia Pacific Regional DNA Barcoding Forum.](#)

Further reading

JR deWaard, A Mitchell, MA Keena, D Gopurenko, LM Boykin, et al., 2010. Towards a global barcode library for *Lymantria* (Lepidoptera: Lymantriinae) tussock moths of biosecurity concern. *PLoS ONE* 5(12): e14280. doi:10.1371/journal.pone.0014280

MRS PORRITT *makes a difference*

THE AUSTRALIAN MUSEUM HAS A REMARKABLE OPPORTUNITY TO ACQUIRE NEW AND RARE MATERIAL FROM A LITTLE-STUDIED AREA OF THE PACIFIC, THANKS TO A GENEROUS BEQUEST SAYS **KATE RICHARDSON**.



Patricia M Porritt,
Museum benefactor.

The remote Kermadec Islands, uninhabited save for one small research station, lie in the tropics a thousand kilometres to the northeast of New Zealand.

But it's not so much the islands themselves that have captured the interest of scientists as the promise of abundant and diverse marine life in the surrounding waters.

PEAKS

The islands are peaks emerging from an extensive underwater mountain range, its deep valleys and submerged slopes forming a unique underwater environment.

The surrounding tropical waters offer a rare opportunity to study a pristine marine ecosystem, including populations of fishes that remain untouched by the pressures of commercial fishing.

PARTICIPATION

This opportunity is about to be made into reality thanks to a generous bequest from Patricia Porritt, a former geochemist with CSIRO. Patricia was known for her wide-ranging knowledge, a lifelong curiosity about the natural world and an appreciation of its beauty.

Now, her bequest is making it possible for the Museum to participate in a joint expedition to sample the area's astounding marine diversity.

Sharing the trip will be specialists from the Auckland Museum and War Memorial and the Museum of New Zealand Te Papa Tongarewa.

The expedition is expected to add to the Museum's world-class collections of fish and marine invertebrates, and will further cement the Museum's reputation as a centre of excellence in the study of South Pacific fauna.

The trip should result in enough samples to keep specialists busy for many months studying larval fishes, tropical snappers, luminous lanternfishes, gobies and dartfishes, as well as a range of bivalves, cephalopods, crustaceans and marine worms.

SUPPORT

The Museum increasingly relies on the generosity and support of individuals like Mrs Porritt, and we thank her and our other supporters for helping to ensure a viable future for the Museum.

Mrs Porritt's executors have told us she would have been delighted that her bequest is being used in this area of discovery and to enable the Museum to participate in this important expedition.

KATE RICHARDSON BEQUEST OFFICER

MAKING A DIFFERENCE

If you are thinking about making a bequest, or have already made one, please contact Kate Richardson on 9320 6218 or kate.richardson@austrmus.gov.au for more information.



After 5 years and 19 issues, we've decided to treat our much-loved magazine to a facelift while making it even more environmentally friendly.

YOUR EVENTS

Members events are now detailed in the enclosed *Your events* calendar. This handy pocket-sized guide lists all events the Museum has to offer, not just Members events. It's your go-to guide! Just select the events you'd like to see and book as usual (online, by phone or using the booking form enclosed).

IN TOUCH

And to help you stay in touch with the latest offerings, why not register for the Members free monthly e-newsletter? Just send an email with your first and last name to members@austmus.gov.au with 'subscribe' in the subject line and you'll receive regular monthly updates and occasional special offers.

FREE ENTRY

As a Member, you can now enter our latest exhibition *Rituals of Seduction: Birds of Paradise* free of charge. We're hearing lots of very positive feedback about this exhibition, so I hope you can see it before it closes on 7 August.

If there is anything else that would make your Membership experience more enjoyable, please let me know – I am always ready to listen to your ideas.

Enjoy the new-look magazine!

SERENA TODD

A/Executive Officer – Members

Photo Carl Bento.

TRAVEL with members



One of the most rewarding and unifying experiences of Membership is the opportunity to meet and travel with other Members.

As we go to print, one group of Members is just winding up their trip to Mexico, Belize and Guatemala, while another is about to depart for Madagascar.

In March 2012 we will travel to the mystical and pristine Himalayan kingdom of Bhutan, known for its untouched wilderness and rich Buddhist culture.

This tour has been timed to coincide with the not-to-be-missed Buddhist festival of Paro Tsechu – a mesmerising display of colour, costume, traditional dance, music and ancient mystique.

Our tour will be privileged to witness the unfurling of the giant holy scroll, the Thangka – an event few other Westerners have seen.

It's shaping up to be a really spectacular experience!

To find out more about this trip, or any of our tours, please feel free to speak to me directly on 9320 6225.

Photo World Expeditions.

AUSTRALIAN MUSEUM MEMBERS SINCE 1972, SUPPORTING AUSTRALIA'S FIRST MUSEUM

EXPLORE

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Frank Howarth's photo by Carl Bento

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MAKE A DIFFERENCE!

The Australian Museum strives to inspire the exploration of nature and cultures. We would like to acknowledge the benefactors and corporate partners who support us in achieving this vision.



These generous individuals contribute to scientific research, education and public programs, and assist in the acquisition of items that enrich the Museum's collections. We would especially like to acknowledge those who generously leave a gift to the Australian Museum in their will – a lasting way to benefit generations to come.

Find out how your support can make a difference to the important work of the Australian Museum. Contact the Development Branch on **02 9320 6216** or **development@austmus.gov.au**. Donations to the Australian Museum and its Foundation are tax deductible.



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