Australian museum
nature culture discover

**Spring** September to November 2011

VOLUME 33 NUMBER 3

# explore

## *discover*

BEAUTY FROM NATURE: ART OF THE SCOTT SISTERS

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OUT ON A LIMB: TREE-KANGAROOS

## *culture*

THE LOST CORAL CITY OF LELUH

## *people*

MEET VOLUNTEER HEATHER JOYNES

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# *by* STRATEGY

**Did you know that the Museum will be celebrating its 200th birthday in 2027? It seems a long way off, but we have used this anniversary to focus our minds on how we would like the Museum to be in 2027 and what we need to do to get there.**

Thinking ahead also forces us to wonder what the world might be like then, and how we can do our bit to move us in a positive direction. The biggest issue of all is global warming. For the Museum's part, we've set a goal of being entirely carbon neutral and all our energy and water needs being met from sustainable sources.

### CRINGE

A bigger issue is what we as Australia will do. I am extremely concerned about the excessive politicisation of the carbon debate in Australia and the ongoing media attention to the shrinking number of increasingly shrill climate change deniers. We long ago stopped publicising those 'experts' who claim that smoking doesn't cause cancer or that HIV doesn't cause AIDS. It is time the media stopped giving air to those few who say that human-added $CO_2$ is not causing global warming, or that it's not real.

And let's get past the cringe of saying that Australia should only follow other developed countries in taking action on climate change. We are eternally proud of leadership in sport – let's also be proud of doing something towards securing a habitable world for future generations.

### RESIGNATION

I'm also detecting a subtle but worrying shift in climate change related science. There is a sense of resignation among many scientists that the battle to halt or manage global warming is already lost, as a result of vigorous lobbying by fossil fuel industries and inaction by the world's governments. Now, research emphasis is on predicting and understanding the impacts of global warming. We can all do our part to keep the debate firmly based on scientific principles. Indeed today I met a wonderful woman who is running a personal campaign to keep the minds of her grandchildren open to rational and evidence-based thinking, and who is strongly committed to science communication and education.

If we had more people like this grandmother, I suspect that the climate change deniers, and the media that give them oxygen, would have a tougher time. Let's all work towards Australia being a leader in implementing strategies to reduce $CO_2$ levels, not a reluctant follower. That would really give us something to celebrate for our 200th birthday!

**FRANK HOWARTH**
Director of the Australian Museum

# *the* BUTTERFLY EFFECT *lives of the Scott sisters*

DID THE SCOTT SISTERS, HARRIET AND HELENA, ACHIEVE SUCCESS IN SPITE OF THEIR CIRCUMSTANCES OR BECAUSE OF THEM? ASKS ARCHIVIST **VANESSA FINNEY**.

**To the eyes of many early settlers, the Australian environment appeared strange and hostile, but to the inquisitive mind it offered fascinating opportunities for discovery.**

Such a mind was Alexander Walker (AW) Scott's. Born in India to a physician–botanist father in 1800, Scott attended Cambridge University, graduating with a law degree. He never practised, preferring the life of an entrepreneur with interests spanning salt-making and agriculture to railways, civic institutions and the infrastructure of a growing colony.

Scott settled in Sydney in 1829, captivated not just by the commercial potential of the growing colony, but by its strange flora and fauna. His passion was entomology, especially butterflies and moths, and he spent many years studying and describing them with the ultimate goal of publishing a complete description of the known butterflies and moths of the colonies.

It was to be decades before this dream was realised, and then only thanks to his remarkably talented daughters Helena (1830–1907) and Harriet (1832–1910).

**Right**
The butterflies are perhaps the least significant part of this illustration which also shows the larvae and their host plant, the Swamp Lily, *Crinum pedunculatum*. The original background was by the celebrated landscape artist Conrad Martens, a close family friend who visited the Scott family in Sydney and Ash Island. Illustration Harriet Scott. *AMS193_14*

## HARRY OR HATTIE?

Scott and his wife, also named Harriet, moved from Sydney to Ash Island in the Hunter River estuary near Newcastle in 1846 to raise their family in what must have seemed a naturalist's paradise.

On the island, Helena and Harriet became not only keen and talented natural historians, but artists. Like other women in colonial New South Wales, they were denied a university education. In 1864, Harriet wrote of her frustration to her childhood friend Edward Ramsay, then in the second year of a medical degree at Sydney University:

'I always have thought it would be so nice to have a University education – dear me, I always have a great desire to distinguish myself in some way or other and if I were only a man I might do it, but as I am a woman I can't try … clearly I ought to have been Harry Scott instead of Hattie Scott.'

Helena, her confident and more outspoken younger sister, had no such regrets, declaring to Ramsay in 1863 that:

'I must confess, that … I have no belief whatever in our Sydney University, in fact I think it is a snare & a delusion altogether, & as for the various Professors over it, why, with the exception of Pell & Smith, I think they are a parcel of respectable old women …'

Ramsay may well have agreed because he left medicine without graduating to work in his family's businesses and pursue his interest in natural history. In colonial Sydney, a young, enthusiastic man backed by a privileged (though incomplete) education and the patronage of the Establishment could always succeed, and in 1874 Ramsay was appointed Curator (head) of the Australian Museum – the first Australian to hold the post. Success for the Scott sister came less easily, and then only through their hard work, talent and perseverance.

## AN UNUSUAL EDUCATION

Walker Scott trained his daughters in the habits of the naturalist – observing, collecting, describing and cataloguing specimens – and also passed on some of his artistic skills. With Scott often away on business, the girls probably gained their early observational education from their mother and step-sisters. In later years, Helena fondly recalled that:

'The scent of native flowers is always associated in my mind with the days when we were tiny children and Mama used to take us in the early morning for long rambles in the fragrant bush around the botanic gardens.'

As Harriet and Helena reached their teens, with their skill, knowledge and confidence growing, they took over the research and illustrations for their father's butterfly book. In the relative isolation of Ash Island, they devoted most of the next 20 years to collecting Australian butterflies and moths, raising them to observe and describe their life histories, drawing and painting each stage in exquisite, colourful detail.

The finished paintings show the adult and larval butterflies with their host plants, some with local landscapes in the background copied from the works of Conrad Martens.

## FALLING OUT

Harriet and Helena's reputation as collectors and natural history illustrators grew steadily, and they corresponded with a network of scientists and amateurs alike about their work. AW Scott was happy to acknowledge his daughters' work, putting their names above his own on their joint 1864 publication *Australian Lepidoptera and their Transformations*.

The sisters also worked for Edward Ramsay, illustrating his studies on bird eggs and insects, and for their father's other scientific contacts in Sydney, including collector and colonial administrator WS Macleay, and curators of the Australian Museum George Bennett and Gerard Krefft. In 1865, Harriet was delighted to report to Ramsay:

'Fancy Mr Krefft introducing Papa to a friend of his … a Mr Pitt … and the said Mr Pitt accosting Papa with "Are you the Mr Scott that has the clever daughters?"'

*"They were part of the first generation of Australian-born settlers to turn their attention to the unique Australian environment"*

**Top left**
Alexander Walker Scott – entrepreneur, entomologist and eccentric father of the Scott sisters.

**Bottom left**
Helena Scott married surveyor Edward Forde in 1864 but was widowed two years later.

**Opposite**
These preliminary drawings of butterfly body parts include a whimsical sketch of the artist's hand.

**Top right**
Edward Ramsay became Curator of the Australian Museum in 1874. *AMS160058*

**Bottom right**
Portrait believed to be of Harriet Scott, the younger of the two sisters, in 1863 (aged 31), *artist unknown*. Mitchell Library, State Library of NSW. *MLMSS 1694*

But the warm personal relationship between Ramsey and the two sisters had soon deteriorated. Within months, and for reasons that remain unclear, they had fallen out and were not on speaking terms for many years.

## COMPLETION

Sadly, AW Scott did not live to see the publication of the second volume of his work, dying in 1884. It was Curator Edward Ramsey who persuaded the Australian Museum to purchase the *Lepidoptera* papers, including Harriet and Helena's butterfly and moth paintings. Edited by Helena (now Forde) and entomologist Sidney Olliff, the book was finally published by the Museum in five parts between 1890 and 1898.

Ramsay is remembered for his prominent public role in the colony's fledgling scientific community and as Museum Curator. Yet the work of the Scott sisters, their detailed studies of one small part of the natural world, was largely forgotten until historian Nancy Gray brought their paintings to public attention in the 1970s.

The sisters distinguished themselves as both artists and scientists. They were part of the first generation of Australian-born settlers to turn their attention to the unique Australian environment. Their jewel-bright watercolours of butterflies and moths, held in the Australian Museum for more than 125 years, will finally be displayed along with their notebooks, sketches, personal correspondence and specimens in the exhibition *Beauty from Nature: Art of the Scott Sisters*.

**VANESSA FINNEY** MANAGER, ARCHIVES AND RECORDS

**WEBLINK ›**

Discover the art and science of the Scott family at www.australianmuseum.net.au/Beauty-from-Nature-Art-of-the-Scott-Sisters.

# *on the* RECORD

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/scientific-publications.**

## ROCK-ART SCIENCE

Twenty archaeologists combine to honour the Museum's Dr Val Attenbrow in this single volume. Using Val's innovative research methods and theoretical approaches, the authors provide a snapshot of some contemporary research into Aboriginal material culture in the Sydney region, from stone tools to ancient rock art.

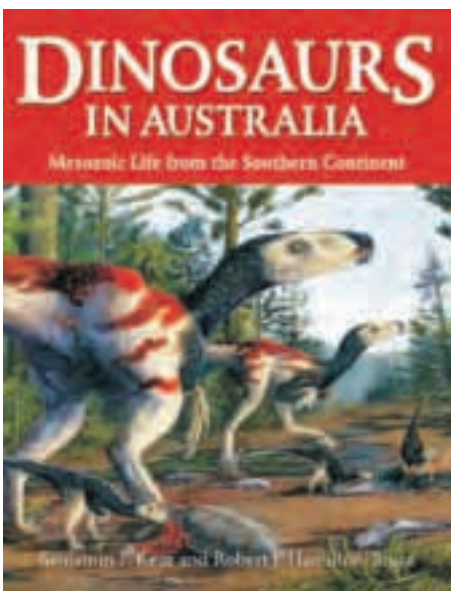
Jim Specht & Robin Torrence (eds) 2011.
Changing perspectives in Australian archaeology.
*Technical Reports of the Australian Museum, Online* 23.
dx.doi.org/10.3853/j.1835-4211.23.2011.1565

## MIDNIGHT SNAPPER

Fisheries managers take note: the Midnight Snapper is highly vulnerable to exploitation. Its long-lived adults (up to 50 years) abound in coral reef habitats; yet the larvae, described for the first time in this paper by the Museum's Amanda Hay and Jeff Leis, are very rare. The implication is that the large adult population results from longevity, not high recruitment of young fish.

Amanda Hay & Jeffrey Leis, 2011.
The pelagic larva of the Midnight Snapper, *Macolor macularis*.
*Records of the Australian Museum* 63: 85–88.
dx.doi.org/10.3853/j.0067-1975.63.2011.1578

# *re*VIEW




**DINOSAURS IN AUSTRALIA. MESOZOIC LIFE FROM THE SOUTHERN CONTINENT**

by Benjamin Kear & Robert Hamilton-Bruce
CSIRO Publishing, 2011

Palaeontologists are pretty scarce in Australia; so too are books written by them for general consumption. That's why it is pleasing to see this comprehensive and up-to-date coverage of Australian Mesozoic fossils. *Dinosaurs in Australia* covers all Mesozoic fossils and stratigraphy in Australia but, despite the title, devotes only a small proportion to dinosaurs. It's a handsome colour illustrated book (though the text would have benefited from more-rigorous fact-checking and review). This welcome addition to the small collection of works on Australian palaeontology requires only a moderate scientific knowledge to be readily understood and enjoyed.

**ROBERT JONES** SENIOR FELLOW, PALAEONTOLOGY

## 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.

# *your*SAY

## LOOK AND FEEL

We love the new look and feel of *Explore* magazine.
*ML, Sydney, NSW*

Thanks! The paper used is an uncoated, carbon-neutral paper made from 100% post-consumer recycled waste. It is printed (using alcohol-free, vegetable-based inks made from renewable sources) under the printer's accredited ISO 14001 environmental management system. What this means is that *Explore* is now about as sustainable as any print publication can be!
*The Editor*

## DUMBING DOWN

Sadly the new-look *Explore* does not appeal. The extra space in the setting out of the articles makes one feel there is a lack of information, a dumbing down … I don't think we as adults want full page photographs of important people and large spaces.
*CC, Lorne, NSW*

*Design Manager Gabrielle Tydd replies*: 'As part of the re-design, we wanted to feature beautiful objects and images from the Museum's collection by presenting them in full pages. We've also introduced a sustainable, uncoated paper stock that poses additional production considerations, and photographs work better at larger sizes. The white space throughout is intended to help the reader navigate stories more readily.'

## FAREWELL COURTENAY AND SCOTT

The Museum community has sadly farewelled two of its highly regarded members. Senior Research Fellow Dr Courtenay Smithers, an entomologist specialising in butterflies and bark lice, and security guard Scott Mellish, an accomplished amateur astronomer, have passed away in recent weeks. To read about these two remarkable Museum identities, visit the weblinks below.

**WEBLINK ›**

Scott Mellish: www.australianmuseum.net.au/Farewell-to-our-friend-Scott-Mellish.
Courtenay Smithers: www.australianmuseum.net.au/Courtenay-Smithers.


## WINTER ISSUE

We omitted the front cover caption for *Explore* 33(2) which featured Cultural Collections Manager Dion Peita with examples of baskets by NZ artist Lisa Ward. The photograph was taken by Museum photographer Carl Bento.


tree-

Goodfellow's Tree-kangaroo, *Dendrolagus goodfellowi*, is found in New Guinea. Photo © Richard Ashurst.

EVOLUTION CAN TAKE SOME SURPRISING TWISTS AND TURNS, AND NONE MORE SO THAN WITH KANGAROOS THAT LIVE IN TREES, SAYS EVOLUTIONARY BIOLOGIST **MARK ELDRIDGE**.

# *out on a limb* with KANGAROOS

**Drop bears and tree-kangaroos? They both sound like the creation of an Antipodean sense of humour, designed to lead astray unsuspecting tourists.**

After all, why would an animal like a kangaroo, so superbly adapted to bounding around on the vast open Australian plains, come to live over 30 metres above ground in the tangled forest canopy where opportunities for hopping are quite limited?

Indeed, the return of one branch of the kangaroo and wallaby family (the group we know as macropods) to life in the trees is an enduring mystery of marsupial evolution. But we are getting ahead of ourselves.

## ARBOREAL EXISTENCE

Unlike drop bears, tree-kangaroos really do exist – but only in the rainforests of Australia and New Guinea.

The first time I saw one was as a child in the early 1970s at a wildlife park (run by renowned naturalist David Fleay) at Burleigh Heads on Queensland's Gold Coast. These beautiful and marvellously improbably macropods have intrigued me ever since. It was over 20 years before I finally encountered one in the wild, this time on the Atherton Tableland west of Cairns, and only then after several nights of spotlighting.

Tree-kangaroos are excellent climbers, spending most of their time in the forest canopy where they feed on the leaves of trees and vines. In New Guinea, tree-kangaroos are quite diverse, with eight species recognised, mostly inhabiting the cool and very wet highland rainforests.

*"tree-kangaroos underwent major and quite rapid morphological changes as they made the transition to an arboreal lifestyle"*

**Top**
Dr Mark Eldridge. Photo Stuart Humphreys.

**Bottom**
Lumholtz's Tree-kangaroo, *Dendrolagus lumholtzi*, is one of two Australian species. Photo Norm Chaffer.

In Australia, there are now just two species: Lumholtz's Tree-kangaroo, *Dendrolagus lumholtzi*, and Bennett's Tree-kangaroo, *Dendrolagus bennettianus*. Both are found only in the Wet Tropics of far north-east Queensland, one species on each side of the Daintree River. The fossil record, however, indicates that tree-kangaroos were previously widespread throughout Australia in both rainforest and dry forest habitats with many more species than today.

## ROCK-WALLABIES

My interest in tree-kangaroos stems from many years of studying rock-wallabies, a quite different group of macropods, first at Macquarie University and more recently at the Museum. Rock-wallabies, as their name suggests, are adapted to exploit complex rocky environments, which they do with consummate skill and agility, climbing and descending quite steep rock faces with ease and precision. These abilities also enable them to climb trees to find both shelter and food.

On field trips with colleagues, we would often joke about rock-wallabies being part tree-kangaroo, so you can imagine our delight and surprise when recent studies confirmed our frivolous speculations. Despite major differences in their morphology, tree-kangaroos and rock-wallabies are indeed closely related, sharing a common ancestor as recently (in evolutionary time) as 8 million years ago.

So are tree-kangaroos really just rock-wallabies that moved into the trees? And what drove this evolutionary step? To escape predation? To exploit foliage as an abundant untapped food resource? To escape parasites and infections carried by faeces? Whatever the cause, ancestral tree-kangaroos underwent major and quite rapid morphological changes as they made the transition to an arboreal (tree-dwelling) lifestyle.

## LAW-BREAKERS

Weighing up to 17 kilograms, tree-kangaroos are the largest arboreal animals in both Australia and New Guinea. Their feet are short and broad, and their forelimbs have become massively developed to facilitate gripping and climbing. Though often slow moving, even clumsy, in trees, they have evolved other specialisations for their arboreal existence, such as flexible ankle joints and, in some species, the ability to walk bipedally (like humans).

This ability to move or rotate the ankle joint is an intriguing feature of their evolution. Other macropods evolved rigid ankle joints from a more flexible ancestor as an adaptation for moving by hopping, so tree-kangaroos must then have *re-acquired* flexible ankle joints. Clearly tree-kangaroos have not heard Dollo's law of evolution biology, which states that evolution is not reversible … or was it that Louis Dollo (a nineteenth-century Belgian paleontologist) had never heard of tree-kangaroos?

## PATH TO EXTINCTION?

Despite their obvious scientific interest, tree-kangaroos are not easy subjects for study and they remain one of the most poorly known groups of mammals. Fieldwork is hampered by their remote, often-inaccessible, natural habitats and their secretive, nocturnal lifestyles, and so we know little about their ecology, behaviour or reproduction. We are not even sure how many species exist; four new species or subspecies of tree-kangaroo have been described by Australian Museum researchers since 1990 and it is highly likely that more await discovery.

The uncertain identification of tree-kangaroos is hindering efforts to develop and implement effective conservation measures, especially in New Guinea. It is greatly concerning that most of the known tree-kangaroo species are seriously threatened with extinction, both as a result of the destruction of their forest habitat (for logging, agriculture and mining) and because they are hunted for food by the growing numbers of people who share their forests. Already, as a consequence of human activity, many tree-kangaroos have been eliminated from large areas where they once thrived.

If we are to ensure their survival, we need to urgently identify how many species of tree-kangaroo there are, where they occur and how they are interrelated. What we think of as one widely spread species represented by several populations could turn out to be two or more restricted species. The loss of one population, perhaps due to a misinformed land-use decision, while bad enough, could become the loss of a previously unrecognised species.

It is fitting indeed that tree-kangaroos, perhaps because of their large size and charismatic nature, are increasingly being used as flagship species to promote rainforest biodiversity conservation.

**EVIDENCE**

This lack of basic knowledge also highlights a critical role for natural history museums and their collections. The Australian Museum has the most comprehensive collection of tree-kangaroo specimens in the world and, with funding from the Hermon Slade Foundation, we have recently commenced a research project using DNA sequence data to establish a clear taxonomy for tree-kangaroos that should underpin future conservation efforts.

Scientists currently recognise just 10 species of these creatures, but our preliminary DNA sequencing data has already identified 13 highly divergent lineages, each of which appears to represent a distinct species. Clearly tree-kangaroos are much more diverse than previously thought. We will also be using our DNA sequence data to unravel some of the mysteries surrounding the evolutionary origins of tree kangaroos [see panel]. For example, did the group originate in Australia and subsequently spread to New Guinea, or was it the other way around?

So while tree-kangaroos are now slowly revealing their secrets, it remains astonishing that even in the twenty-first century new species of large mammals can still be discovered right on Australia's doorstep. It makes you wonder what else is still out there … maybe even drop bears?

**DR MARK ELDRIDGE** RESEARCH SCIENTIST

**WEBLINK ›**

Discover a black-and-white tree-kangaroo at www.australianmuseum.net.au/Mammology-Collection-Tree-Kangaroo-from-New-Guinea.

## WHERE DID MACROPODS COME FROM?

The modern Australian marsupial fauna is dominated by macropods, but this has not always been the case. Millions of years ago, when Australia was wetter and more heavily forested, the ancestor of modern macropods was most likely a small possum-like creature that lived in the canopy of the rainforest covering much of continent.

As the Australian landmass drifted slowly north and became progressively more arid, the ancestors of modern macropods moved down from the trees to become terrestrial and exploit the opportunities offered by the increasingly open vegetation and dry environment.

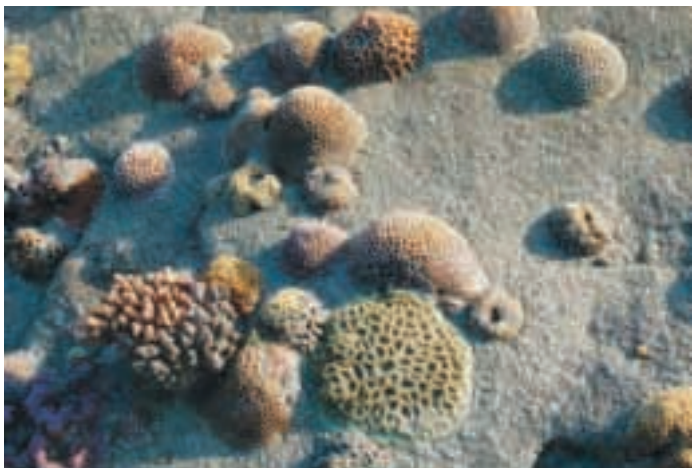
The resulting adaptive radiation led to a multitude of different macropods of all sizes, with species as tiny as 500 grams and some larger species up to 200 kilograms (the so-called Megafauna) browsing and grazing on shrubs and grasses. Some macropod species were perhaps carnivorous (though scientists are re-examining this supposition). We do know that while many became extinct, at least 60 macropod species survive today.

One of the keys to macropod success is the ability to move by hopping – a rather odd but nevertheless efficient way of getting around in an increasingly arid environment. Among other things, hopping requires an upright stance, well-developed muscles of the hind legs (with reduced development of forearms), a large tail for counterbalance, and restricted lateral movements of the ankles (to prevent spraining).

In returning to an arboreal habitat, tree-kangaroos have reversed most of these characteristics to re-acquire bipedal movement, stronger forearms, reduced hind legs and moveable ankles.

# KIMBERLEY CORALS *exposed*

EVERY REEF IS FASCINATING – SOME FOR THEIR DIVERSITY, OTHERS FOR THEIR DYNAMIC NATURE, AND MOST FOR THE SUBTLE INTERACTIONS BETWEEN THEIR INHABITANTS – BUT FOR **ZOE RICHARDS** ANTICIPATION PEAKS FOR REEFS THAT HAVE NEVER BEEN EXPLORED BEFORE.



**In Australia, there is no greater opportunity to explore new reefs than in the Kimberley. Often assumed to be too dangerous for scuba diving (due to huge tides, bad water visibility, cyclones and crocodiles) the Kimberley remains Australia's last frontier, both on land and in the sea.**

I've recently returned from the second Kimberley expedition where my collaborators and I aim to describe the marine biodiversity of this largely unexplored region. This trip targeted two reef formations in the northern Kimberley: Long Reef and Cassini Island. Our ongoing Kimberley research program aims to place the status of Kimberley reefs in a national and international context and provide critical information to benefit their future management and conservation.

While others in the team searched for crustaceans, molluscs, echinoderms, fish and marine flora, I wanted to know which corals were present in the Kimberley and how their communities are structured.

## DIVERSE AND PROLIFIC

Investigating coral ecology requires a standardised scientific sampling approach, so I was geared up to conduct replicated belt transects – designated areas of the reef in which the abundance of each type of coral is recorded. I also collected coral skeletal and molecular material to support larger projects looking at the evolutionary and geographic relationships between Kimberley corals and those in neighbouring bioregions.

From the first Kimberley research expedition, conducted in 2009 on Montgomery Reef and Adele Island to the south, I knew the Kimberley corals were truly diverse and prolific, recording 170 species of scleractinian (hard) coral.

In that expedition, the visually spectacular low-tide cascades at the edges of Montgomery Reef provided a wonderful backdrop for a highlight of the expedition: the discovery of a unique habitat zone dominated by a mixed assemblage of coralliths and rhodoliths. These colonies of free-living nodules are entirely covered by living tissue. The free-living form is thought to arise where constant unidirectional currents and tidal pull on surface sediments keep the coral in motion so it is unable to attach permanently.

**Above left**
Zoe Richards recording the diversity and abundance of hard corals along a belt transect at Montgomery Reef. Photo © Clay Bryce.

**Above right**
Juvenile corals growing on bare rock, photographed at low tide. Photo Zoe Richards.

**Opposite**
*Acropora aspera* conceals a colony of *Tubipora* sp. while exposed at low tide (Long Reef). Photo © Dr Phil Tucak.

*"These expeditions have confirmed that the pristine status of the Kimberley is certainly reflected in its underwater habitats"*

The receding tide at Long Reef reveals extensive underwater channelling, which provides a plethora of opportunities for exploration.
Photo © Clay Bryce.

## SECOND EXPEDITION

Approximately 300 kilometres to the northeast and 12 months later, I surveyed Cassini Island and Long Reef. I was to discover that Cassini Island, although small, has many different fringing reef habitats: atoll-like lagoons with isolated coral bommies (bomboras or submerged reefs), steep reef fronts with strong channelling, and extensive intertidal flats with coral on the mid and lower reef platforms. All of these structures support well-developed seagrass and macro-algal communities providing abundant breeding habitat for Green Turtles and many other organisms.

The water surrounding Cassini Island was surprisingly clear at some sites, which may account for the exceptionally high diversity (90 species) of hard coral I recorded within a single depth zone (12 metres) at a single site. Given the small area surveyed (60 square metres), this level of diversity is outstanding and far higher than at any of the other sites.

At Long Reef, water visibility was lower than at Cassini Island because the reef is directly in the path of outflow from Admiralty Gulf, which carries suspended sediments and other material. But even here we discovered a unique habitat zone on the western side of the reef dominated by Organ Pipe Coral, *Tubipora* sp., covering an average 27 per cent of the subtidal platform on the southwest side of the reef – a record coverage for this type of coral.

## PRISTINE

Overall, the most outstanding feature of Kimberley corals is their health. Despite routine low-tide exposure to extreme air temperatures, light and, during the monsoon season, rainfall, along with high levels of turbidity from storms and cyclones, Kimberley corals are exceptionally healthy, showing few signs of stress or disease. I recorded only a few predatory Crown-of-thorns Starfish and no outbreaks of predatory molluscs, nor evidence of any recent coral bleaching.

These expeditions have confirmed that the pristine status of the Kimberley is certainly reflected in its underwater habitats. The well-developed reefs of the Kimberley inshore bioregion are of global significance and provide an unparalleled opportunity to examine coral reef communities in the absence of human impact.

**DR ZOE RICHARDS** CHADWICK BIODIVERSITY FELLOW

*This work was part of the* Woodside Collection Project (Kimberley)*, managed by the Western Australian Museum and Woodside Energy Pty Ltd, with partner institutions the Australian Museum, Queensland Museum, Museum Victoria and the Western Australian Herbarium (Department of Conservation and Environment).*

**WEBLINK ›**

Hear Dr Zoe Richards talk about her work at www.australianmuseum.net.au/movie/Zoe-in-the-lab.

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

# *search* › DISCOVER

This rainforest snail, *Thersites mitchellae*, may have fallen prey to a carnivorous slug. The shell diameter is 27 mm. Photo courtesy John Lindsay, Mullumbimby.

**Q.** *I found this land snail with a hole drilled into its shell. What might have made it?*

The hole is similar to those made by some predatory gastropods such as the carnivorous slug *Atopos* (family Rathouisiidae), but I have never seen *Atopos* prey on shells as large as this one.

In Borneo, rathouisiids are known to drill holes in snail shells to rasp out the contents, but this feeding strategy has not been documented from Australia, and nothing is known of their diet here (though I have seen empty drilled shells of the Charopidae, a family of mostly litter-dwelling micro-snails). Another family of carnivorous snails in Australia (the Rhytididae) feeds on other snails but they attack directly through the shell aperture, not by drilling.

**MICHAEL SHEA**

**WEBLINK ›**

See the carnivorous slug *Atopos australis* at www.australianmuseum.net.au/image/Atopos-australis.

Adult Longfin Eel, *Anguilla reinhardtii*, swim to breeding grounds near New Caledonia. Photo © Ian Shaw.

**Q.** *Is it true that eels swim all the way to New Zealand to breed?*

All 18 or so species of Australian eel have the same basic life history. Some certainly travel a long way – more than 6000 kilometres – to breed, but it is to warm ocean waters they go, not New Zealand. It's a remarkable journey that can take up to seven months. During this time they live off stored fat supplies. On arrival, they mate, spawn and then die.

When the eggs hatch, the tiny larval fish (leptocephali) swim to Australian coastal waters, a journey that can take up to 12 months. They then swim upstream into estuaries and rivers as elvers (juveniles). They grow and mature over many years before returning as adults to their ocean breeding grounds to complete the life cycle.

**SOPHIE MASTERS**

**WEBLINK ›**

Why do some eels grow to 3 metres? Find out at www.australianmuseum.net.au/Longfin-Eel-Anguilla-reinhardtii.

There's more to bluebottles than stingers and gasbags. Photo Bill Rudman.

**Q.** *What is the gas in a bluebottle float?*

The bluebottle, *Physalia utriculus*, is related to jellyfish but is actually a *siphonophore*, a type of hydroid. Individuals are considered to be a 'colony' of four hydrozoan polyps, each specialised for reproduction, feeding, defence or, of interest here, floating.

The *pneumatophore* (float) can be up to 15 centimetres long and is filled mostly with air, but it includes a higher concentration of carbon monoxide (a toxic gas rarely found in living things). The float has musculature that can help the colony adjust its orientation and 'sail' with the wind. The defence polyp possesses nematocysts (stinging cells) along its tentacles, which can deliver a painful sting to swimmers. If you are stung, apply a cold pack to relieve the pain.

**STEVE VOGEL**

**WEBLINK ›**

Find out more about bluebottles at www.seaslugforum.net/showall/physalia.

# *The lost coral city of* LELUH

SLOWLY DISAPPEARING BENEATH THE ENCROACHING TROPICAL JUNGLE ON THE ISLAND OF KOSRAE LIES AN ANCIENT RUINED CITY, TESTAMENT TO AN ENIGMATIC ANCIENT CIVILISATION AND ITS UNPARALLELED RELATIONSHIP WITH THE SURROUNDING CORAL REEFS, SAYS CHADWICK BIODIVERSITY FELLOW **ZOE RICHARDS**.

*"Overall, the amount of coral removed from the reef to build the city would have been enormous."*

**Right**
Kosrae (formally Oualan) has long been a renowned navigational landmark to Pacific Ocean mariners. Map from *Voyage Autour du Monde … Atlas*.

**Opposite**
Inhabitants of Kosrae in 1824, drawn by Louis-Francois LeJeune (ship's artist for *La Coquille*, commanded by Louis Duperrey) and published in *Voyage Autour du Monde … Atlas*, 1826.


## MAKING A DIFFERENCE

The Chadwick Biodiversity Fellowship is made possible by a generous bequest to the Australian Museum Foundation by Clarence E Chadwick. If you are thinking of making a bequest to the Museum, or have already made one, please contact Kate Richardson, telephone 02 9320 6218 or kate.richardson@austmus.gov.au for further information.

**The central Pacific island of Kosrae, once known as Oualan, may be one of the lesser known tourist destinations in the Caroline Islands, but it holds one of the world's great architectural wonders – the lost coral city of Leluh.**

At its peak, Leluh was home to perhaps 1500 people, most notably kings and high chiefs, but also low chiefs and commoners. Known as the ancient capital of the Pacific Ocean, this island city housed a complex hierarchical society that developed over the six centuries before being contacted by Europeans in the 1820s.

The city itself evolved on the east coast of Kosrae and was built over a shallow reef infilled with coral. A seawall provided protection from storm surges, and an extensive canal system navigable at high tide gave access to many of the compounds and boat landings.

### SISTER CITIES

The ruins at Leluh are globally significant because they hold important information about the customs and structure of the ancient Kosraen civilisation before European contact. They are listed (with the better known Nan Madol ruins on the neighbouring island of Pohnpei) on the National Register of Historic Places (USA).

The shared history of these sister cities is most apparent in the distinctive architecture of their walls and canals built of monumental prismatic basalt. Like Leluh, Nan Madol was built on artificial fill over a shallow lagoon.

But one fundamental difference between the two ancient cities has escaped wider recognition: the prolific use of coral in the construction of roads, terraces, canals and compound walls. Coral was also used in the preparation of food, for cultural and spiritual practices and, most notably, in the burial of royalty.

Burial chambers made of coral and basalt formed a type of truncated pyramid called a saru. Historical accounts suggest that the corpse of a Kosraen king, anointed with coconut oil and bound in mats and coloured cordage, would be interred in the saru for up to three months. The royal bones were then exhumed, cleaned, re-bound and secondarily buried in a specific hole on the nearby reef.

While pyramidal structures are a common feature of many ancient civilisations, the truncated pyramids of Leluh are unique because whole coral colonies were used in their construction.

### LIVING CORAL

While conducting a reconnaissance mission in Kosrae last year I came across these decaying pyramids, largely hidden by the encroaching vegetation, and was astonished to find they were made of coral. After seeking appropriate permissions, I began to study the coral further and found fourteen genera of hard coral were used to build the pyramids, which, judging by the lack of abrasion of coral skeletal structures, must have been collected live from the nearby reef, rather than from the shoreline as rubble. Indeed, according to Kosraean legend, the people of Leluh '… formed a line across the extensive shallow reef … and passed the extracted coral from hand to hand'.

continued on page 26

# *a case of* MISTAKEN *identity?*

'GIMME THE TOWN AN' ITS CLAMOUR AN' CLUTTER;
I AIN'T VERY FOND OF THE BUSH;
FOR MY COBBERS ARE COVES OF THE GARDENS AND GUTTER –
A TOUGH METROPOLITAN PUSH.'
From CJ Dennis, 1933. *The Indian Myna*.

**If you live on Australia's east coast, there are two birds you have almost certainly seen (and heard): the Noisy Miner, *Manorina melanocephala*, and the Common (or Indian) Myna, *Sturnus tristis*. Both are fist-sized, yellow-beaked, yellow-legged, in-your-face kinds of birds, but in spite of their similar voices and names they are quite unrelated. The former (spelt M-I-N-E-R) is a native Australian honeyeater, mostly coloured grey, while the latter (spelt M-Y-N-A) is a member of the starling family introduced from Asia and mostly coloured brown.**

One of these species has ornithologists concerned because of its impact on small native birds. More than 30 scientific papers describe the pugnacious exclusion of other birds from this pest's territories, motivating a group of scientists and land managers to meet in Albury earlier this year to thrash out what could be done to counter the menace. One of the outcomes was a nomination for the species to be listed as a Key Threatening Process under the Commonwealth Environmental Protection and Biodiversity Conservation Act. That nomination is currently being considered.

But – shock, horror! – the species they want listed is the native Noisy Miner, not the introduced Common Myna! How can this be, when there is a handy immigrant scapegoat occupying our suburbs? Surely this is unAustralian!

**Opposite**
The native Noisy Miner is an aggressive territorial cooperative nester that drives out other birds in many environments. Photo Richard Major.

**Below**
The introduced Common Myna may be a pest to humans but poses little threat to biodiversity, according to ecologist Dr Richard Major.

## MINERS THREATEN DIVERSITY

Research in a variety of human-modified landscapes across eastern Australia has conclusively demonstrated that groups of the cooperatively nesting Noisy Miner actively exclude from their territories almost all smaller birds and many larger. This occurs both in urban landscapes (street plantings and backyards) and across the remnant fragments of woodland that once dominated much of eastern Australia. Even corridors of eucalypts planted to restore woodland habitat have failed to attract many bird species because of colonisation by the Noisy Miner.

The miner's secret to success is that these modified environments – simplified habitats dominated by trees and grass and little other understorey – provide it with perfect conditions. The miner feeds on nectar, insects and the carbohydrate exudates of eucalypt-feeding bugs, but it also forages on the ground. Habitats with poorly developed understoreys make better feeding areas for the miner and are easier to defend from invading birds, while the abundant trees in these habitats provide plenty of sites for its open-cup nests. Consequently, the Noisy Miner has become far more abundant and widespread than it was before European settlement and it now presents a significant threat to a number of threatened species, including the Regent Honeyeater and Swift Parrot. It has been described as a 'reverse keystone' species, one that reduces the biodiversity of an environment rather than underpinning it.

## SCAPEGOAT

In contrast, the Common Myna has attracted widespread loathing among the public and local authorities but surprisingly little interest from scientists; it simply does not have the same 'reverse keystone' qualities as its namesake. Ecological studies have not detected significant negative impacts on native birds from the Common Myna. Even the 'Backyard Biffo' survey, conducted by residents contributing to the Birds in Backyards project, did not rank the myna as a significant aggressor. One study has shown that the myna will occupy some natural hollows, giving it the potential to compete with native hollow-nesters such as the Eastern Rosella, but the myna has a marked preference for nesting in roofs and other artificial structures not favoured by native species. It thrives in urban environments, as CJ Dennis well knew in the 1930s, and, despite its spread into towns up and down the coast, there is little indication that it is moving into 'natural' habitats – at this stage.

So why is the Common Myna so widely reviled? Is its poor public image well deserved? I would say not. The open season on mynas declared by numerous local councils is not evidence based. While it would be a sensible precaution to control the spread of the species on the urban–woodland interface, mass trapping and killing of mynas in urban centres is a waste of resources. Yes, they eat pet food, nest in roofs and crap on clothes lines, particularly those near their noisy roosting aggregations. But it is disingenuous of local councils to react to public lobbying by promoting their control programs as exercises in biodiversity conservation. They are not.

## PARADOX

In fact, many of the incorrect claims made about the birds by local councils on their websites just feed public hysteria. I believe that councils have a responsibility to improve the biodiversity values of urban landscapes, but their efforts would be better spent on reversing the ongoing degradation of urban bushland or by encouraging plantings of understorey shrubs. Assisting ratepayers to trap and kill Common Mynas in the name of biodiversity conservation is a misinformed policy, at best.

It's a paradox, but we need to give a higher priority to limiting the dominance of the native Noisy Miner, a true Australian champion, by enhancing habitats for other native species, rather than getting in a flap about an exotic suburbanite whose harm is overstated.

**DR RICHARD MAJOR** SENIOR RESEARCH SCIENTIST

**WEBLINK ›**

Share your comments about urban bird diversity at www.australianmuseum.net.au/blogpost/myna-or-miner.

# MR SCOTT'S *butterflies*

HARRIET AND HELENA SCOTT'S ILLUSTRATIONS HAVE RIGHTLY EARNED THEM A PLACE IN AUSTRALIAN SCIENTIFIC HISTORY, BUT LET'S NOT OVERLOOK THE SCIENTIFIC CONTRIBUTIONS MADE BY THEIR FATHER, ALEXANDER WALKER SCOTT, SAYS ENTOMOLOGIST **DAVE BRITTON**.

**The current Museum exhibition *Beauty from Nature: Art of the Scott Sisters* focuses on the lives and work of the Scott sisters, Harriet and Helena, and their wonderful illustrations of Australian natural history.**

Many of these works were completed for their father, Alexander (Walker Scott), who was the first to describe some truly iconic Australian moths and provide detail on the immature stages of these insects.

## CATERPILLARS

Until Scott, most of the taxonomic work on Australian moths and butterflies was undertaken by scientists in the Northern Hemisphere, particularly in England and Europe, based purely on pinned or papered dry adult specimens.

Then, as now, the taxonomy of moths and butterflies was based largely on the adults, which are easier to preserve than the larvae (caterpillars) and have numerous useful characters for descriptions. In these early descriptions, information on the early life stages, if any, was often restricted to a brief text note on the appearance of the larva and its host plants.

Yet many Australian caterpillars are spectacular both in appearance and behaviour, and the Scotts captured much of this information in their illustrations in a way that could scarcely be improved upon. They also made detailed observations on the host plants, and the illustrations of these were equally impressive.

## ICONS

Walker Scott was the first to describe notable large and beautiful moths such as the Bent-wing Swift Moth, *Zelotypia stacyi*, and many of the splendid swift moths in the genus *Aenetus*. Many of these moths do not fly to light, or have very short flight periods in the wild, which meant they were overlooked by earlier collectors. The larvae of these species tunnel in living trees, leaving distinctive damage. Scott and his daughters were obviously experts in detecting the larvae and rearing out the adults.

While Scott had received some formal training in entomology, he was sometimes out of touch with the knowledge of the day. Many of the species to which he assigned new names were already known to entomologists in Britain and Europe, including common and conspicuous butterflies such as the Blue Triangle, *Graphium sarpedon*, and the Pale Green Triangle, *Graphium eurypylus*. But this naivety sometimes gave way to significant discoveries; for example, he was the first to describe another Australian icon, the Emperor Gum Moth, *Opodiphthera eucalypti*, even though this large, common moth must have been encountered by earlier collectors.

## COLLECTION

The Scott specimens open a window into the history of collecting in early colonial Australia. Scott and his daughters had access to the Australian Museum library and were in regular contact with Museum staff – Scott himself became a Museum Trustee in 1864. They donated many specimens to the Museum, including the original (type) specimens he used in the descriptions of new species.

Like all naturalists, Scott collected many specimens which he would send or give to other taxonomists to describe, and many of these can be found in the Museum collection. They include type species described by the prolific English taxonomist Edward Meyrick, a microlepidopteran specialist, and species described by the Assistant Zoologist (Entomologist) at the Museum, Arthur Sidney Olliff.

Scott's interest in *Aenetus* also led him to source specimens from other collectors, and in 1869 he published a paper on the genus in the *Transactions of the New South Wales Entomological Society*. Some of the specimens used for this paper are also preserved in the Museum collection.

## DETECTIVE WORK

The Scott family's donations to the Museum over many years became dispersed throughout the collection according to their taxonomic identity (rather than grouped by donor). Thanks to some thorough detective work delving through registers and scientific articles, surviving specimens have been located for display as part of the Museum exhibition.

While many are in poor condition, being preserved in ways that would not be acceptable to a modern collector, they form an interesting collection, and we at least have Harriet and Helena's wonderful illustrations to show how these must once have looked.

**DR DAVE BRITTON** COLLECTION MANAGER, ENTOMOLOGY

**WEBLINK ›**

Hear Dave Britton discuss the Scott sisters exhibition at www.australianmuseum.net.au/movie/Alexander-walker-scott.

**Left**
Common Ghost/Swift Moth, *Aenetus eximia* (Hepialidae). This is Scott's original specimen, dating from 1869. *K191018*.

It is shown with Harriet Scott's illustration of the adult, larva and host plant. The illustration has retained its colour, unlike the faded specimen. *AMS193_7*. Photo Stuart Humphreys.

**HEATHER JOYNES**, ONE OF THE AUSTRALIAN MUSEUM'S LONGEST SERVING VOLUNTEERS, REMINISCES ABOUT VOLUNTEERING AT THE MUSEUM OVER 35 YEARS AND HER 'OLD FRIENDS'. SHE SPOKE TO **HEATHER MACKAY** AND **MARCELA PACHECO**.

# A STITCH IN TIME...

## *Heather Joynes*

# *"what we did 35 years ago you tackle quite differently now"*

**HEATHER JOYNES**

**At the heart of the Museum is a collection of more than 18 million objects – a giant physical database for exhibitions and research. Conserving and managing the collection takes energy, specialist knowledge and enthusiasm, plus a little help from volunteers like Heather Joynes.**

Heather, who turns 88 this year, is a well-known embroiderer in Australia and New Zealand and has authored 10 books on embroidery. Her work is represented in the Powerhouse Museum collection and in private collections throughout Australia.

**Top left**
Embroiderer Heather Joynes celebrates 35 years as a volunteer at the Museum. Photo © Jack Joynes.

**Left**
Captain Cook's cloak is just one of the Museum's treasures that Heather Joynes has helped to conserve. Photo Carl Bento.

**How did you begin volunteering at the museum?**

A member of the Embroiderer's Guild, Carol Serventy, said the Museum was looking for volunteers to work on a Tibetan bone apron that required re-stringing for *The Himalayas* exhibition. After we finished that, we worked on a Balinese painting cloth, and they just kept on finding jobs, so we stayed and loved it, always enjoyed it … Tuesday was always Museum day and I always remember that whenever we came in, Sue Walston [former head of the conservation laboratory] would lift her head and say, 'It must be Tuesday!'

**How have things changed in the conservation lab since 1976?**

That's hard to say really. I suppose there were many more staff in the [materials conservation] lab in those days, and there was always someone doing research on something … whereas now people don't have the time. The thing I have noticed is what we did 35 years ago you tackle quite differently now. One instance would be when Nardine [Turner] and I worked on that Canadian button blanket. It was very stained you know and we washed it. Well you wouldn't do that now – you would leave that all as part of its history, you would leave all that staining there. I wouldn't say we restored it, but it was almost a restoration. You'd probably tackle it quite differently now.

**What has been your favourite object that you have worked on?**

I think that the feather cloak [Captain Cook's cloak] from Hawaii, because I've worked on that more than once and it's sort of an old friend. It is a magnificent thing. I can remember the first time we worked on it … it was in this perspex box that had been cut to shape, and I think it was going back to Hawaii for an exhibition over there. But first of all we had to sew a backing to it which we didn't think it needed because the plant fibre that it was made out of was so strong. But anyway we did it and then we had to sew it into the box which we had between two tables. I sat underneath and Jean Vere put the needle through the hole and then I would push the needle up from underneath in the next hole. It was quite a scream really.

**Do you think that volunteering at the Museum has had an influence on your embroidery designs?**

Oh, for sure, yes things like patterns and colours, I'm sure I have been influenced by things I've seen. I love butterflies and at one stage I was going to do a butterfly life cycle and was going to go up to the library to find something there, but I never quite got that far! You are unconsciously influenced by what you see. I've always loved beads and there are lots of beaded things in the collection.

**What do you hope for the Museum's future?**

That's a very difficult question isn't it? I hope they still get plenty of volunteers. I'm sure they will and it should be encouraged. I think the Museum's collections need more exhibiting and I'd like to see more of that. The Museum has such a wonderful Aboriginal collection for example. And another thing I'd like to see is more research …

**HEATHER MACKAY** CONSERVATION OFFICER &
**MARCELA PACHECO** EXECUTIVE ASSISTANT

# IBIS *resort*

**I chose this photograph, taken by Richard Major, because of its impact. Sand, sea and ibis? Well actually it's a puddle on the edge of a rubbish dump in western Sydney!**

The traditional breeding grounds of the Australian White Ibis in New South Wales were the inland swamps, such as the Macquarie Marshes. With the loss and degradation of wetlands, associated with increasing diversion of water for agriculture, ibis are turning to novel habitats that meet their resource needs, often in urban areas.

**CATE LOWE** PHOTO EDITOR

**WEBLINK ›**

View ibis heaven at www.australianmuseum.net.au/movie/ibis-heaven. Read about Richard's ibis studies at www.australianmuseum.net.au/document/urban-ibis.

**Below**
Listening through headphones for tell-tale blips picked up by the aerial, Museum ecologist Dr Richard Major tracks the movements of radio-tagged ibis in urban Sydney. Photo Stuart Humphreys.

**Right**
This foraging site in Sydney's west attracted more than 3000 ibis, some of whom (based on tagged individuals) were commuting to their nestlings more than 20 kilometres away.

Such aggregations of native animals can be inspirational to those of us prepared to put up with some of their less-endearing qualities. Text, photo and caption Richard Major.

continued
from page 17

The tomb walls stand two metres high and three metres wide at the base. To build them would have required an estimated 12,000 corals (either as fragments or whole colonies) – equivalent to around 0.8 hectares of continuous coral reef (but a much larger area when you consider that only certain types of coral were selected and these are generally patchy in the lagoons).

Coral was also used extensively in constructing the internal and external walls of at least 20 other compounds in the city, to build terraces and floors, pave roads, build canal walls and construct the one-kilometre-long, three-metre-high seawall surrounding the entire city. Coral was also in the landfill used to reclaim over 180,000 square metres of lagoonal habitat.

Overall, the amount of coral removed from the reef to build the city would have been enormous. To extract and translocate such quantities of coral required significant labour and logistical support within the framework of a highly structured society.

## CORAL PYRAMIDS

It is the use of coral colonies as a construction material that distinguishes the Leluh pyramids from all others.

Some of the structures within the 27-hectare Leluh city have been altered, but the sacred compound and burial chambers remain largely intact.

While many ancient Pacific island cultures necessarily utilised local products and altered their immediate environment in the process, ancient Kosreans are the only society known to have used live coral and coral reefs extensively in building their cities and in their royal mortuary customs.

It is surprising that so little is known about this fascinating ancient wonder of the Pacific given that its ancient feudal system was replaced only recently by democracy and Christianity brought to the island by American missionaries in the mid-nineteenth century.

There is much more to learn and, with the continued support of the Australian Museum, I hope to study the corals of Leluh using new dating techniques. With wider international recognition of the site's global significance, we can help ensure the continued preservation of the Leluh ruins, truly one of the world's great hidden wonders.

**DR ZOE RICHARDS** AUSTRALIAN MUSEUM CHADWICK BIODIVERSITY FELLOW

**Above left**
A pathway paved with flat coral links compounds within the Leluh ruins site.

**Above centre**
A truncated coral pyramid (saru) forms the royal crypt where Kosraen kings were temporarily entombed.

**Above right**
The stacked prismatic basalt style of construction is typical of the nearby Nan Madol ruins in Pohnpei. Photos © JPA Hobbs.

*This study would not have been possible without the kind assistance of JPA Hobbs and the support of Berlin Sigrah from the Kosrae State Historic Preservation Office and the Kosrae Village.*

**Further reading**

**WN Morgan, 1989. *Prehistoric architecture in Micronesia*. University of Texas Press, Austin.**

**ZT Richards & JPA Hobbs, 2011. Prehistoric Pacific Island kings entombed in truncated coral pyramids. *Coral Reefs* doi 10.1007/s00338-011-0780-0**

# *keeping the spirit alive*

**Top to bottom**
*Plug and Pray*
*Mountain Musical*
*Because We Were Born*

**The Margaret Mead Film Festival is named for controversial US anthropologist Margaret Mead, a remarkable figure in 20th century cultural studies.**

Mead achieved early career fame for her studies of adolescents in 1920s Samoa. Criticised for romanticising and oversimplifying Pacific cultures, she pursued her own vision, embracing the use of film and photography and reaching beyond academia into popular culture.

Keeping her spirit alive is this annual film festival featuring the world's best cultural documentaries, now showing during Jurassic Lounge on Tuesday nights. For bookings, phone 02 9320 6225.

**WEBLINK ›**

See complete listing of all events and book at www.australianmuseum.net.au/whatson.

## SHOOTING WITH MURSI

Deep in the heart of Ethiopia's fertile Omo Valley, the Mursi are a nomadic people ruled by consensus and the wisdom of elders. Uprooting seasonally in order to graze their cattle and avoid the rainy season, they now find themselves encircled by three national parks, none of which they are allowed to enter.

As their culture faces extinction, Mursi man Olisarali Olibui takes a digital camera among his tribe, capturing a candid portrayal of his people and their customs as they face the modern world.

**Tuesday 13 September**

Directors Olisarali Olibui and Ben Young, 2009, 57 mins, Ethiopia

## PLUG & PRAY

Fifty years ago, computers in their current form were the stuff of science fiction. The next generation of technology researchers see robots as the future … but will they be good for us?

In *Plug & Pray*, one man comes forward to doubt the wisdom of this goal. Computer programming pioneer Joseph Weizenbaum urges us to reconsider our wholehearted embrace of technology – before it's too late.

**Tuesday 6 September**

Directors Judith Malek-Mahdavi and Jenz Schanze, 2009, 91 mins, Germany, Italy, Japan and the US

## MOUNTAIN MUSICAL

Far from the sanitised image associated with Tyrolean folk singers, these hard-working, hard-drinking people from the heart of Bavaria recount in their crisp, rippling yodel the grim and gay details of their lives with equal gusto.

With a fine art photographer's eye for composition and the patience of a paid-by-the-hour psychiatrist, Austrian filmmaker Eva Eckert circles Erzberg coaxing the old-timers into performing their songs. The resulting film provides a moving portrait of an all-but-vanished Alpine culture.

**Tuesday 13 September**

Director Eva Eckart, 2008, 52 mins, Austria

## BECAUSE WE WERE BORN

This film shows us the world through the eyes of Brazilian teens Nego and Cocado as they live by their wits, picking up odd jobs to earn one or two measly reais.

Whether scavenging leftover food, sleeping rough or doing chores at home after a long day's hustle, they turn to each other for comfort and company and wonder what no one of such a tender age should have to wonder: what will become of me?

**Tuesday 20 September**

Director Jean-Pierre Duret and Andrea Santana, 2008, 90 mins, Brazil

**I am forever trying not to make the season the emphasis of my Members Message, but how can I ignore the glorious season of spring, the metamorphosis of the natural world around us!**

### HERALD

Our spring herald is *Beauty from Nature: Art of the Scott Sisters*. This true story of Helena and Harriet Scott is about women, nature and science – the nostalgic romance of a bygone era in scientific discovery. I hope you'll visit this beautiful exhibition drawn from the Museum's own collection – and Members are invited to visit free of charge.

### DESIGN

We've had plenty of comments about the new design of *Explore* magazine, with many giving it the thumbs up: 'clean and crisp', 'feels nice', 'easier for the kids to draw on Xplorer', 'easier to read'. Please keep your feedback coming.

### MARGARET MEAD AND JURASSIC LOUNGE

Jurassic Lounge returns! The trial season earlier this year was a great success, its different events and casual atmosphere attracting new audiences to enjoy the Museum after hours. It's on again every Tuesday night until 20 September and entry includes the Margaret Mead Film Festival (see page 27). The *Your events* calendar has more details. See you in the Museum again soon!

**SERENA TODD**
Executive Officer – Members

Photo Carl Bento.

# TRAVEL *with members*

### MODERN MONGOLIA: LAND OF ANCIENT HORDES

**Departing in June/July 2012, this two-week tour takes in the breathtaking landscapes of Mongolia, from the vast steppe to the flaming cliffs of the Gobi desert. Visiting archaeological 'dinosaur' digs, ancient Buddhist and shamanist sites, and Karakorum – capital of Chingiss (Genghis) Khan's great empire – we'll build a picture of the complex relationship of the Mongols to their ancient land.**

The tour will be led by Sydney historian Sally Wattersen and includes overnight accommodation in a traditional Mongolian ger (yurt), meeting locals and gaining behind-the-scenes insights into the cultural and environmental activities currently reshaping this once mysterious land.

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

Photo Kate Harper.

## EXPLORE

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Frank Howarth's photo by Carl Bento

**Australian Museum**
6 College Street Sydney NSW 2010
Open daily 9.30 am – 5 pm (closed 25 Dec)
t 02 9320 6000 (switch)
02 9320 6225 (Members)
www.australianmuseum.net.au

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**Environmental responsibility**
*Explore* is produced using carbon-neutral processes under an ISO 14001 environmental management system. It is printed on ecoStar, a carbon-neutral paper made from 100% post-consumer recycled waste, using alcohol-free, vegetable-based inks made from renewable sources.



Dr Dave Britton is Collection Manager, Entomology, at the Australian Museum. Dave has located all surviving butterfly specimens donated to the Museum collection by the Scott family. You can see them in the new Museum exhibition *Beauty from Nature: Art of the Scott Sisters*, opening 3 September. Read Dave's story on page 20 and meet him in Xplorer (centre liftout). Photo Stuart Humphreys.



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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.*

Australian museum
nature culture **discover**

**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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James E Layt AM
Christine Jeffery
David Maloney
Margaret Mashford
Roger Massy-Greene
Robert McDougall
Mabs Melville
Stephanie Miller and Martin Pool
Dame Elisabeth Murdoch
John Neuhaus
Justice Henric Nicholas
The Noonan Family
David Norman
Alice Arnott Oppen
Andrew Pardoe
John Pearson
Loris Peggie
Adrian and Dairneen Pilton
Amelia and Scott Reid
Kate Richardson
David Robb
Jane and Neville Rowden
Rosemary Swift
Senta Taft-Hendry
Vera Vargassoff
Tony White
Jennifer Wright