

ARKAROOLA WILDERNESS SANCTUARY



From the ARK

NEWSLETTER NUMBER 11 AUTUMN / WINTER 2009

Despite all predictions 2009 has been a brilliant season. Caravanners, campers and travellers are on the road in numbers not seen for many years. The lure of the Lake, uncertainty about the economy, and some apprehension about travelling during a Swine Flu pandemic, has seen postcodes, not passports, determine holiday destinations. And where better to head to than Arkaroola?

In May we welcomed students and their teachers from Seaview and William Light High Schools, to the biggest, best ventilated classroom in Australia. The group took part in a pilot project which aims to get young people excited about science and consider pursuing scientific careers. Preparations are underway for a comprehensive biosurvey of Arkaroola Wilderness Sanctuary, something we have wanted for more than a decade. In mid September volunteers from the Scientific Expedition Group (SEG) will survey the Mount Painter heartland and southern sections of the property. Who knows what they will find? For more information about these and other stories, read on!

To join our mailing list just email us at marketing@arkaroola.com.au
To download *From the Ark* visit our Web site at www.arkaroola.com.au/breakingnews.php
For an informed commentary on the ongoing Marathon issue visit <http://unknownsa.blogspot.com>

A MESSAGE FROM PETER



G'day Everyone,

As Arkaroola's marketing manager, I'm one of the back-room people. Some of you will have spoken to me so it's about time we put a face to the voice! I have been associated with Arkaroola since about 1982 and served as the company's Chief Pilot for a number of years before Doug took over the reins. The recent flooding of Lake Eyre North has seen a huge increase in tourism to the far north of our state. Doug has been extremely busy with extended scenic flights to that region. The last time I saw the far north looking this good was in 1976, following the complete filling of Lake Eyre North and South in 1974. It's great to see so many travellers on the road again. If you haven't been to Arkaroola for awhile I reckon it's about time you gave us a call. I hope you all enjoy issue Eleven!

Peter

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Design, Text & Images Lorraine Edmunds
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NORTHERN FLINDERS RANGES

SOUTH AUSTRALIA

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ARKAROOLA WILDERNESS SANCTUARY

NEWS FROM THE ARK

SCIENCE 'ROCKS' AT ARKAROOLA



No Facebook. No YouTube. No mobile phone coverage. Surely no place of choice for sixteen and seventeen year-olds? Well ... forty secondary school students were in NO hurry to head back to Adelaide after three busy days 'in the field' at Arkaroola.

During the last week of May, Arkaroola Wilderness Sanctuary became a classroom for forty year 10 and 11 Science, Tourism and Indigenous Studies students from Seaview and William Light High Schools. With their four teachers, the students took part in Arkaroola's inaugural Science/Ecotourism Education Program.

Sponsored by Beach Petroleum and Arkaroola P/L, the pilot program brought students, science practitioners and tour guides together for three days of shared experiences. Professor Ian Plimer and Dr Vic Gostin, both passionate science communicators, headed up the team of presenters with Kate Walsh from Adelaide University. Arkaroola's Doug Sprigg, Sharpy Coulthard, Lorraine Edmunds, Rebecca Clemas, Kaya Klop-Toker and Ryan McMillan provided cultural tours, Ridgetop tours, an introduction to wildlife biology and astronomy sessions. The students created their own local earthquakes which were recorded at Arkaroola's seismological station. They learnt about inverse square law by shouting. (No surprises - a teacher won the shouting competition)! They explored the nature of Time using sundials and pendulums. They set up quadrats to measure the abundance of native and introduced animal species. They tested water quality and conductivity. They tasted bush tucker and looked at distant stars.

Heathgate Resources sent Adam Huddleston and Roger Johnston to Arkaroola to speak about careers in the mining industry. Local Adnyamathanha ranger, Noel Wilton, from neighbouring Vulkathunha Gammon Ranges National Park, joined the group around the campfire on the final evening, to share his songs.

In Australia, as in many developed nations, fewer students are choosing science as a career pathway. By creating opportunities for students to meet with science professionals in the field, we hope we can ignite a new interest in science. Our future geophysicists, engineers, biologists and climatologists are sitting in today's classrooms. Their future, in part, depends upon the opportunities that we can provide for them today. We can help to inspire them by providing role models and mentors. It will be this generation that shapes our future with their innovations, new technologies and future policies.

Arkaroola management would like to thank everyone who contributed to the pilot project, and in particular Professor Ian Plimer, Dr Vic Gostin and Kate Walsh who donated their time. Special thanks also goes to Seaview High School teacher Meri Holt who embraced the project so enthusiastically when Arkaroola began looking for a school to take part in the pilot project. To Meri, Marg, George, Neil and the students of Seaview and William Light High Schools, we thank you all for your great spirit.

Let's do it again in 2010!



Top Year 11 students setting up a quadrat at Bolla Bollana Waterhole.
Middle Dr Victor Gostin explores TIME using Arkaroola's sundials.
Bottom Professor Ian Plimer links equations to rocks and minerals in the field.

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NEWS FROM THE ARK

WAITING FOR THE NEXT ACT

A breach of licensing conditions by exploration miner Marathon Resources, on its lease within the Arkaroola Wilderness Sanctuary, has revealed inadequacies in the South Australian Mining Act. Amendments to the Act are now required to provide stronger protection for the state's environmental assets.

"Marathon's activities on this exploration lease brought to light some deficiencies in compliance and enforcement provisions of the Mining Act 1971 that needs to be strengthened. In the coming months, I will be giving notice of proposed amendments to the Mining Act. As indicated to this Council previously, the Government will not contemplate any ground disturbing activity by Marathon Resources on Exploration Licence 3258, at least until that legislation is in place."

Minister Paul Holloway **Hansard 28th April 2009**

Marathon Resources is maintaining a low-level presence on its Lease (EL 3258). The company is currently undertaking airborne and ground gravity survey work, and stream sediment sampling as approved low-impact activities.

HEAVEN+EARTH

The Professor's message to visiting students from Seaview and William Light High Schools was emphatic! Science must be robust, rigorous and objective. In his new book *Heaven+Earth, Global Warming: The Missing Science*, Ian Plimer argues that these imperatives are absent from climate science.

In his introduction, Professor Plimer states that a multi-disciplinary approach to climate science is critical.

"An understanding of climate requires an amalgamation of astronomy, solar physics, geology, geochronology, geochemistry, sedimentology, tectonics, palaeontology, palaeoecology, glaciology, climatology, meteorology, oceanography, ecology, archaeology and history."

Ian Plimer rejects the notion of anthropogenic, or human induced climate change. He argues that the geological record reveals a planetary history of great climate variability, a 'rollercoaster' of temperature and atmospheric CO₂ permutations over geological time. The great arbiter of climate change, Ian proposes, is the Sun, aided and abetted by cosmic radiation and a host of other non-anthropogenic influences and inputs.

No stranger to controversy, Ian Plimer has ruffled more than a few feathers with his most recent book. Whatever your position in the climate change debate, **Heaven+Earth** is recommended reading. We owe it to the generations who follow us to think deeply, openly and expansively about this issue which has profound economic, biological and cultural implications.

A HOLIDAY WITH SAM

It's not only bands and rock stars who do Roadshows. Every year the South Australian Museum (SAM) heads out onto the bitumen to deliver its *Out of the Glass Case* outreach program. This year SAM is pushing beyond the bitumen and will follow the dirt to Arkaroola.

Research has shown that Australians have a poor understanding and appreciation of science compared with Europeans and Americans. With support from its director Dr Suzanne Miller, a passionate science communicator, the South Australian Museum is trying to reach larger South Australian audiences. Through a range of extension and outreach programs that include Palaeontology Week (March), Science Alive (July), Science Week (August), and the *Out of the Glass Case Roadshow*, SAM provides displays, presentations and interactive activities for school students, families and the general public.

The annual *Out of the Glass Case Roadshow* takes science to regional and remote South Australian communities. This year SAM is coming to Arkaroola during the September school holidays. Activities will include free talks and walks with specialists in palaeontology, geology, wildlife, and history. Eminent Australian geologist and academic, Professor Ian Plimer will deliver the third *Sprigg Lecture* for 2009 at Arkaroola as part of the Roadshow.

The South Australian Museum's
OUT OF THE GLASS CASE ROADSHOW
COMES TO ARKARoola
Sept 25 - Oct 1

The third **Sprigg Lecture** for 2009
will be delivered by Professor Ian Plimer

The final program will be available on Arkaroola's website from early Sept.
www.arkaroola.com.au



To see more images like the one above visit www.thesentimentalbloke.com
Travel with landscape photographer, Peter Mac Donald, as he shares the stories behind his exquisite images, on his new blogsite.

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CREATURE FEATURE

A LETHAL EMBRACE



It wasn't a foil-wrapped chocolate Bilby that Di Harries got this Easter. Visiting Arkaroola from French's Forest in Sydney, Di had a rare encounter with a 'wrapped-tile' package.

Di was probably unaware how remarkable her encounter was. She snapped two rare species, a Stimson's python and the endemic Red-barred dragon. The lizard, *Ctenophorus vadrappa*, takes its specific name from a Flinders Ranges Adnyamathanha word. The adult male 'Vadr-apa', meaning first-stage initiate, is a boldly patterned and colourful lizard.

Liasis stimsoni or the Stimson's python is often mistakenly identified as a Children's python, (*Liasis childreni*), a Top End species. Small pythons of inland Australia, Stimson's pythons are occasionally seen in Arkaroola Village, hunting on warm summer and autumn evenings.

Thanks Di for sharing this remarkable image with us.

PLANT PROFILE

POISON, PARADISE, PILL OR PARADOX?

Mandrake and potato. Belladonna and eggplant. Tobacco and capsicum. Datura and bush tomato. Believe it or not, they're all family!

Recorded in ancient texts, the paradoxical Solanaceae have been used to heal, to hallucinate, to poison and to appease hunger for thousands of years. A family of plants of great economic importance globally, the Solanaceae yield staple food crops, poisons, narcotics and drugs used in medicine. The leaves, flowers and immature fruits of most members of this family contain toxic alkaloids. In the right hands, the powerful alkaloids can bring relief from a variety of conditions. Said to cure haemorrhoids, dysentery, syphilis, rheumatism, impotence, ulcers, kidney disorders, and even crocodile-bite, this is indeed a potent plant group.

In the New World as in the Old, in the developed world and the developing world, the Solanaceae is one of Nature's most valued pharmacopoeias. It has provided drug therapies for ancient herbalists, Indigenous Medicine Men and chemotherapists alike. A cream containing alkaloids extracted from Solanum fruits has been used as a highly effective treatment for benign and malignant skin tumours. Solasodine, an extract from an Australian solanum, *S. aviculare*, is used in the manufacture of the contraceptive pill.

In pre-contact Australia, the most valued member of the Solanaceae family was pituri or *Duboisia hopwoodi*. An animal poison and a narcotic, it was traded by Aboriginal groups, the length of the continent. Flinders Ranges groups exchanged high quality ochre and grinding stones for the desert narcotic. They also ate the fruits of several Solanum species that grow in the Flinders Ranges.

Although it makes a great bush tomato chutney, this group of plants is not for bush tucker novices!



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GEONOTE

FROM THE ARKHIVES

“NATURE’S LITTLE PROSPECTORS”

Mineral exploration often comes with a significant cost to the environment. Although mandated checks and balances are supposed to minimise impacts, some companies continue to test legislation, as past events on the EL 3258 Mount Gee lease confirm. Innovative new techniques like bioprospecting are providing exploration companies with minimal-impact options that offer much better protection for natural and cultural assets.

Dr Steve Hill from the School of Earth & Environmental Sciences at Adelaide University, has enlisted “*nature’s little prospectors*” to help him search for minerals. Plants, ants, termites and kangaroos are all providing clues about what lies beneath the surface.

Deep-rooted trees like River red gums penetrate through weathered rock to reach groundwater supplies that may be as much as 30 metres below the surface. If there is mineralisation in the groundwater beneath the gum, it will be absorbed and distributed through the body of the tree. Research teams have found gold, copper, zinc, lead, uranium and other minerals, by looking at leaves, stems, bark and leaf litter, using an electron microscope. Triodia, or spinifex as it is popularly known, is also an important prospector plant. With root systems of ten metres or more, Triodias probe for water at depth. Triodias, Gum-barked coolibahs, Curly mallees, Mulgas, Black oaks and Northern cypress pines, have all been tested as part of research by Dr Hill and his students.

Termites carry tiny gold nuggets and other trace metals back to their mounds, while meat ants absorb uranium from rocks beneath the surface soils in which they build their nests. Uranium also appears to be concentrated in euro droppings collected on the plains near the Beverely uranium mine. The plants on which the euros feed, absorb geochemical signatures from the soils. The signatures are preserved as roo poo which become valuable little information packages. In 2008, euro poo lead Dr Hill and his team to a new ore body discovery near Broken Hill.

Passive prospecting offers a great alternative to high-impact prospecting using heavy equipment. To learn more about Dr Hill’s work go to the website below.



A TOWER OF A MAN

An insatiable curiosity is a defining characteristic of many celebrated scientists. Remembered primarily as a geologist who also discovered and described the earliest multi-cellular metazoan life, Reg’s interests were as diverse as his accomplishments.

As a government geologist and later a consultant geologist, Reg Sprigg spent many months in the deserts of Australia. An acute observer, Reg noticed that the longitudinal dunes of the Simpson Desert did not reflect modern prevailing wind patterns. So he set out to measure wind speed and direction to test his belief that the dune systems of Australia’s deserts were formed during the last Ice Age, (18000 years ago). Reg installed measuring stations across southern and inland Australia, where information about modern wind trends and seasonal changes in surface wind directions, was recorded. In 1990 Reg received an Honorary Doctorate from Flinders University for his work on wind systems and dune evolution in the deserts of Australia.

When they established Arkaroola Village, the Sprigg family had hoped to use wind power for electricity generation. However there was insufficient wind within the mountains to drive the giant-bladed windmills and deliver a sustainable supply.



Reg and Doug Sprigg changing over paper records at the Cootabarlow recording station on the Lake Frome plains.

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CONSERVATION & RESEARCH

A BIRTHDAY BIOSURVEY

The aims of the Scientific Expedition Group (SEG) include:

- The promotion and running of expeditions of a scientific, cultural and adventurous nature
- The furthering of knowledge, understanding and appreciation of the natural environment
- Promotion of the values and philosophy of wilderness
- Enabling people to learn the skills required for planning and running expeditions, and to develop sound field techniques

For more information about go to:
www.communitywebs.org/ScientificExpeditionGroup/default.htm

The tragic demise of much of Australia's unique fauna over the past two hundred years, is well documented. The Flinders Ranges is part of this sad story. During the 1980s, Canberra linguist Dorothy Tunbridge, spent several years in the northern Flinders Ranges. Working closely with Adnyamathanha elders from the Nepabunna community, she was able to establish that more than 60% of local mammal species had disappeared from the ranges since the arrival of Europeans in the 1850s. Many of the vanished animals, like quolls and bilbies, endure in the Adnyamathanha Dreaming. The sub-fossil remains of small marsupials and rodents, recovered from own pellets and cave deposits, support Dorothy's work.

With its short pastoral history, rugged terrain and unique geology, it might just be possible that Arkaroola Wilderness Sanctuary continues to provide a refuge for species that have disappeared from other parts of the Flinders Ranges. Although one survey cannot be expected to reveal a complete picture of the sanctuary's animal diversity, it marks the beginning of a process that is long overdue. Thanks SEG!

SEG turns 25 this year. And part of the group's birthday celebrations will include a gift to Arkaroola. The Scientific Expedition Group will undertake a comprehensive biosurvey of Arkaroola Wilderness Sanctuary in September.

For twenty-five years, experienced biologists, natural historians and volunteers with a deep interest in the natural world, have been undertaking valuable survey and monitoring activities throughout South Australia. The group includes retired and working members, who volunteer their recreational time to undertake field expeditions that will help us to better understand our diverse natural environments. Herpetologists, ornithologists, entomologists, botanists and zoologists put on their rucksacks and head to wherever the work is to be done. This spring the 'ologists' are coming to Arkaroola.

Using standard biological survey methods that have been approved by the South Australian Wildlife Ethics Committee, SEG will sample sixteen sites in 2009. With its complex geology, nine different Land Systems, and rocky terrain, Arkaroola presents a great logistical challenge for the expeditioners. SEG has already sent three advance teams to Arkaroola to select and prepare representative sites across each Land System. Expeditioners will use a suite of survey tools including Elliott and cage traps, soft collapsible funnel traps where pitfalls cannot be dug, and pitfall traps. All traps will be opened for four consecutive nights. Each morning the traps will be inspected and re-opened again in the afternoon. Opportunistic sightings will be recorded and vegetation sampled at each survey site. A camp and laboratory will be set up at the Arkaroola Homestead and shearers quarters for the duration of the survey.

Below An advance party installs pitfall traps in Arkaroola's challenging terrain.



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TOO PRECIOUS TO MINE

GALACTIC GOSSIP

ARKAROOOLA'S ANCIENT ARCHIVES



Like ancient texts in a public library, the rocks of Mount Gee and Mount Painter hold stories of the distant past. Reaching far back beyond the exploits on Mount Olympus and the battles along the Tigris and Euphrates rivers, these texts tell of life's ancient beginnings.

In the late 1970s biologists added a third branch to the Tree of Life. The discovery of microbes that thrive in the Earth's most hostile environments, in volcanic vents, radio-active hot springs and deep in the Earth's crust, expanded our knowledge of our evolutionary heritage. Genetically distinct from bacteria and anything else known to exist, the Archaea were new to science. The single-celled microbes may endure in rocks as signatures of ancient life.

Archaea are of great interest to astrobiologists, with some predicting that Archean signatures will be found on Mars. Dr Malcolm Walter of the Australian Centre for Astrobiology, recognises the importance of Mount Gee and Mount Painter to science. *"I see Mount Painter and Mount Gee as analogues for the sorts of places we want to explore on Mars"*. Here the complex plumbing of a large hot spring system which, 300 million years ago, would have looked something like Rotorua does today, is now exposed on the surface. In tiny pores within these rocks, there may be traces of the early Archaeans. Persisting as hydrocarbon signatures, the Archaeans can be extracted from crushed rock. Organic chemists can then interpret the rock's history including its age, the temperatures of the original rock-forming environment and the organisms that were present. Techniques being developed on Earth will have applications for future Mars missions.

Do we want to assign our precious outdoor library to memory, like the ancient Royal Library of Alexandria? The original library held the largest collection of manuscripts in the world. Scholars gathered in the ancient city, a great centre of learning, to share ideas in maths, astronomy, physics and the natural sciences. Founded in 288BC, the Royal Library was destroyed in a massive fire in the third century AD. Much of Alexandria's ancient wisdom was lost forever. We must do all that we can to protect our ancient library. **It is much too precious to mine!**

MARTIANS ON THE MOVE!

Advocacy for Mars and Moon missions through research and extension activities are key objectives of the Mars Society Australia (MSA), the Australian chapter of the international organisation. In this, the International Year of Astronomy, the MSA and NASA collaborated to deliver the Spaceward Bound Australia 2009 Expedition.

A group of Australian and American teachers spent a week in the field recently with ten world-class scientists from America and Australia. Astrobiologists, planetary scientists, microbiologists, a geologist, physicist, roboticist and two Australian PhD students conducted a number of research activities at Arkaroola, before moving on to Marree and Lyndhurst. The field expedition, sponsored by the CSIRO, was led by NASA's Dr Chris McKay who delivered the opening address at the Australian Mars Exploration Conference in Adelaide on July 17th.

Australian Roboticist, Dr Graham Mann, tested robotic equipment over a range of terrains and substrates before conducting a series of simulated maintenance patrols in the field. Microbiologists looked at the microbial ecology of the radio-active Paralana hot springs, cold springs and pools. DNA was extracted from microbial communities for the creation of clone libraries, and samples of desert cyanobacteria collected for comparative studies with material from the Atacama and Mohave Deserts. Groundwater discharge sites that share similarities with features on the Martian surface, were investigated. Biomineralisation by microbes and the signatures they leave were examined as potential indicators of life-forms that may be found on Mars.

The participating teachers, who travelled from America, Tasmania, NSW and Queensland, all share a passion for space exploration. They are keen to develop a range of curricula to inspire, nurture and prepare the next generation of space explorers. The planetary scientists, engineers and astronauts, who will deliver NASA's **"Moon, Mars and Beyond"** programs, are sitting in their classrooms today.

Focus group meetings were held with the teachers during the expedition and will be followed up with questionnaires that explore how teachers applied their expedition experience to their classroom teaching.

RAINFALL to end July
82.6 mm
18 days of precipitation
Most fell in January & June

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PRODUCT INFORMATION

LAKE EYRE FLIGHTS

Lake Eyre looks much more spectacular from the eye of a pelican than the eye of a Lake Eyre dragon. With less than a metre of water remaining in the lake, now is the time to fly.



In those rare years when floodwaters from the Channel Country reach Lake Eyre, the lights turn green and the traffic heads inland. Tens of thousands of migratory birds converge on the lake and its islands, to feed and breed. And thousands of visitors follow them, to witness a spectacular explosion of life in the desert.

Arkaroola Air Services offer two Lake Eyre flights:

Northern Flinders / Lake Eyre / Goyder's Lagoon

Includes the Strzelecki Desert, Lake Hope, Cooper Creek, Goyder's Lagoon, Warburton River, Warburton Groove, Lake Eyre North, Lake Eyre South. (Bird lovers tour of 5½ hrs)

Northern Flinders/ Lake Eyre

Includes the Strzelecki, Tirrari, and Simpson Deserts, Madigan's Gulf, Belt Bay, Jack Boot Bay, Marree Man, Mound Springs. (3½ hours)

Prices vary depending on numbers and are available on request, by ringing or emailing Arkaroola Wilderness Sanctuary.

FROM THE ARK POSTCARD



Mount Painter Moon

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