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Sanctuary Asia

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TRAVEL

ALL ABOARD PLANET EARTH

A look at seafaring humans, their trusty vessels, and protecting our life-supporting home.

CONSERVATION

A DAY AT THE MUSEUM

Tapping into the natural world's past to understand and protect the future.

PHOTOFEATURE

THEY LIVE AMONG US

Many of our co-passengers on this floating planet can be strange-looking!

BE the Change.

TAKE ACTION

I BRAKE FOR SNAKES

Raising awareness to prevent wild animal roadkills.

CUB

FOR YOUNG READERS

ON THE COVER

Spaceship Earth.

When seen from space, the earth is a ship, and all of us her passengers. Like the crew of an efficient ship, we must work together in harmony to keep the vessel – and all of us – safe.

Photo Credit: Dr. Anish Andheria

FOREVER STRIPES

The survival of the tiger and all the creatures that share its habitat, including leopards, wild dogs, elephants, rhinos and uncounted plants, insects, birds and reptiles, depends on whether humans can set aside vast undisturbed wildernesses for nature.

The wildlife conservation movement needs the support of us all. For more information on how you can help, or to pledge your support for those who work round-the-clock to protect our wildlife, write to Dr. Anish Andheria (President, Wildlife Conservation Trust) at anish@wctindia.org or visit www.wildlifeconservationtrust.org

#DOGOODBEGOOD

DSP
MUTUAL FUND

TABLE OF CONTENTS

Here's a list of what you will find in the September 2023 issue of *Sanctuary Cub* Magazine...

Earthrise!

Planet Earth rises, as glimpsed from the Moon's surface by the Lunar Reconnaissance Orbiter, over the Compton crater.

We all know how our view of the moon changes, with every Moonset and Moonrise. But what about the view of the Earth from the Moon, Earth's only natural satellite? Astronauts on the Moon have a very different perspective. From the lunar surface, the Earth never rises or sets, as the Moon is 'tidally locked' to Earth. The Earth hangs in the same spot on the Moon's horizon, with only its visible part changing, as the Moon revolves around our planet. Atleast, this is the view from the 'nearside' of the Moon, which is always facing the Earth. The far side never sees Earth at all!

This breathtaking glimpse of our planet from space is emblematic of this issue's theme – SPACESHIP EARTH. Voyaging through the vast expanse of space, Earth is an interstellar vessel, and we – every human, every last animal and plant, every single-celled organism – are all her passengers.

Seen from the Compton Crater of the Moon, a view of the 'blue marble' that is Earth showcases the African continent, with the Sahara Desert prominent. The shadows in the foreground are from the mountain peaks in the crater's centre.

PHOTO CREDIT NASA/Goddard/Arizona State University (ASU)

PHOTOGRAPHER'S NOTE
This image was taken by the Lunar Reconnaissance Orbiter (LRO) when LRO was 134 km. above the farside crater Compton. The image was captured by rolling the spacecraft to the side, while LRO was travelling at over 1,600 m. per second!

Editor Randhir Sahgal (Bittu Sahgal)
Consultant Editor, Design and Layout Tara Sahgal
Executive Editor Lakshmy Raman
Senior Editor Madhu Sikri
Assistant Editor Shatakshi Gawade
Assistant Editor Bhavya Iyer
Social Media Editor Malaika Shah
Consultant Director, Science and Conservation Dr. Parvish Pandya
Consultant, Projects and Natural History Saurabh Sawant
Photo Editor Prachi Galange
DTP Rajkumar Gopalan, Umesh Bobade
Image Editing Rajkumar Gopalan
Subscription and Circulation P. Bhaskar
Advertising Shashi Kumar, Nishita Kanojia
Printing Silverpoint Press Pvt. Ltd., Mumbai
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SANCTUARY ASIA, 146, Pragati Industrial Estate, N. M. Joshi Marg, Lower Parel (E), Mumbai – 400011.
Email admin@sanctuaryasia.com
Website www.sanctuarynaturefoundation.org

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All Aboard Planet Earth.

Like a ship's crew works together to keep the vessel stable, all species are connected for survival. The environment is a key component of adventures at sea. Who are the explorers and conservationists on these vessels of Earth? Text by Shatakshi Gawade.

One thought ever at the fore –
That at the Divine Ship, the World, breathing Time and Space,
All peoples of the globe together sail, sail the same voyage, are bound to the same destination.

– Walt Whitman, *Old Age Echoes, Leaves of Grass* (1891)

About 60,000 years ago *Homo sapiens* began a tryst with exploration, on foot. Eventually, they graduated to journeys across the sea, which led to discoveries of new lands, species and climates. Over the years, oceanic voyages have been undertaken for resources, travel, transport, and even conservation.

The Ancients

Six thousand years ago, the Egyptians used 100-m. boats with sails and oars for transport and movement of material in the Nile. Evidence from 700,000 to a million years ago suggests that seafaring was developed by human ancestors who came before *Homo sapiens*!

The fabled ***Noah's Ark*** saved Noah and his family and a pair of every animal on Earth from a devastating flood. The Biblical Ark leaves us with a message for times when climate change is triggering more frequent natural disasters such as floods – conservation of every species is crucial for the survival of humankind.

The Crusaders

In real life, we can hardly save every species aboard a single ship – there are at least 8.7 million species on

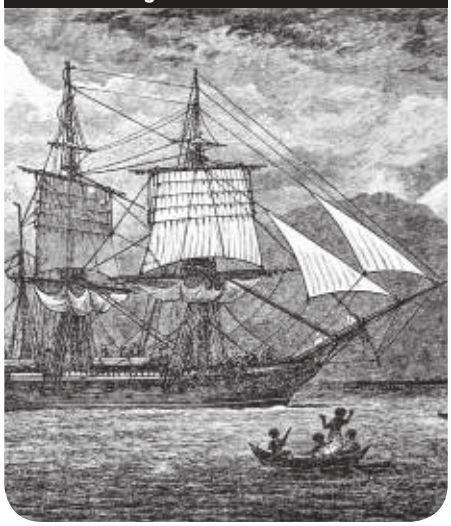
The Greenpeace *Rainbow Warrrior II* ship on the Bosphorus river in Turkey campaigned against the practice of scrapping ships containing toxic materials.

PUBLIC DOMAIN/SALVATORE BARBERA

Egyptian oar boat in hieroglyphics.

PUBLIC DOMAIN

The *HMS Beagle*.



PUBLIC DOMAIN

A Sea Shepherd ship.

PUBLIC DOMAIN

Earth! Instead, some humans have taken to the seas for conservation of marine and other species, and to mitigate climate change.

Greenpeace, a global campaigning network founded in 1971, has been sailing across the oceans in their fight for environmental justice. Their sea vessels ***Rainbow Warrior***, ***Arctic Sunrise*** and the ***Witness*** have campaigned against seal hunting, nuclear testing, and conducted research on climate change. Similarly, for over 40 years now, the non-profit ***Sea Shepherd*** has been using direct action to highlight marine environmental issues. They once used their ship to ram into and destroy a pirate whaling vessel in Portugal. Their fleet has 10 ships and several smaller boats.

THE SCI-FI SHIPS

~ In *Twenty Thousand Leagues Under the Sea*, the protagonists search for a giant monster that they discover to be a futuristic submarine, the *Nautilus* commanded by Captain Nemo, who is fuelled by the quest for scientific knowledge and escaping civilisation.

~ *The Hitchhiker's Guide to the Galaxy* features a simple human man, who explores the galaxy aboard the spaceship *The Heart of Gold*, which can pass through every point in every universe simultaneously.

~ In *Star Trek – the Voyage Home*, a massive, metallic cylinder – the whale probe – threatens to eliminate Earth's population unless it can speak to a humpback whale.

The (R)evolutionaries

The ***HMS Beagle*** sailed from 1831 to 1836 from its home country England to South America, and returned via Australia. The journey was the origin of Charles Darwin as the Father of Modern Biology. He collected 5,436 specimens, maintained a 770 page diary, and wrote thousands of pages of notes, which he parsed to develop his theories, especially the theory of evolution by natural selection. He also witnessed colonialism and the horrors of slavery in British colonies.

In the 21st Century, there is more awareness about the polluting impacts of the shipping industry. Enter ***Porrima***. The Swiss vessel runs on renewable energy from the Sun, hydrogen and wind. Gunter Pauli, her designer, says, "When you have no engine running, there's silence. There's a real sense of awe and resilience. There's a clear feeling of, 'I'm vulnerable – I better use what I have carefully.'" The Porrima's philosophy is to use resources effectively, with a focus on environmental research.

The Pale Blue Dot

Seen from outer space, isn't the Earth like a spaceship sailing through the vast Universe? More than 70 per cent of the Earth's surface is covered by oceans, giving it the appearance of a 'pale blue dot'. Over 80 per cent of the oceans are unexplored, a challenge for researchers and a

The Porrima.

PUBLIC DOMAIN

temptation for extreme travel. U.S. space agency NASA is on a mission to study life in the deepest parts of the ocean to understand other worlds in the solar system. Meanwhile, these same waters are a challenge for migrants in dingy vessels escaping difficult living conditions. Or for the blue whale, which was almost driven to extinction by commercial whaling. It is up to us to protect **Spaceship Earth** from excesses, because whether we go far up into space or far below into the oceans, humans have one planet to live on and return to.

Shatakshi Gawade is an Assistant Editor at *Sanctuary Asia*. She has worked with mainstream media, as a freelancer, and with organisations that focus on the environment, as a researcher and communication consultant.

NATURE WATCH

LIGHTNING BUGS

With the light of stars from distant galaxies forming trails, lightning bugs or fireflies brighten up the night sky with their bioluminescence during the monsoon. Males illuminate the forest, to attract females. Each species has a unique flashing pattern, much like the unique light signatures of different galaxies.

SANGRAM GOVARDHANE/SANCTUARY PHOTOLIBRARY

SUPPORT LIFE ON EARTH!

TAKE ACTION

The ‘I BRAKE FOR SNAKES’ campaign will raise awareness on snake roadkills.

The state of Goa, which has over 60 per cent of its geographical area under forest cover, sees scores of snakes getting killed during road crossings, especially in the monsoon months every year. The warm roads are enticing in the cool morning and evening for the cold-blooded reptiles. Though snakes by default will flee approaching vehicles, they are often not fast enough, leading to fatalities.

The need to save snakes from a disturbing and avoidable death has prompted herpetologist and wildlife photographer Nirmal Kulkarni to initiate the ‘I BRAKE FOR SNAKES’ campaign in Goa. Stickers have been launched that carry the tagline of the campaign, promising proactive involvement in saving snakes. Nirmal, who is a Member of the Goa State Biodiversity Board and a Member of the Viper Specialist Group IUCN, believes the campaign will raise awareness among motorists and hopes it will save vital lives and ecologically important species. The stickers will also serve as conversation starters. Imagine being at a petrol station and discussing snake conservation while fuelling up!

Often on roads that pass through and near wildlife areas, other animals too fall prey to speeding vehicles. Roads split up animal habitats, affecting availability of food and water, migration routes and even breeding. In addition to working towards conserving snakes, this campaign is also an attempt to bring empathy and awareness for vehicle drivers to slow down when they see animals such as deer, elephants, tigers, turtles and frogs, or any animal crossing the road, and give it the right of way, especially in forested areas in the state and to particularly stop speeding at night.

SUSHMITHA REDDY/SANCTUARY PHOTOLIBRARY

Scores of snakes get killed during road crossings, especially in the monsoon months every year.

COURTESY NIRMAL KULKARNI

Smaller species such as snakes are often killed by speeding vehicles.

WHAT YOU CAN DO:

- The ‘I BRAKE FOR SNAKES’ car bumper stickers are available for free with HERPACTIVE representatives in Goa. Connect with them on WhatsApp at 9673531636 for details.
- Remind adults driving vehicles you are in to slow down in forested and wildlife areas, including on city roads where animals such as cats, dogs and cows live.
- Snake Road in Shawnee National Forest, Illinois (USA) is shut for four months to allow snakes to migrate to and fro between their summer and winter homes. If there are no road signs in and near wild spaces that you know of, or if you have observed speeding vehicles and roadkills, write to your local authorities such as the Municipal Commissioner, Mayor and MLAs or MPs to put up clear and visible warning signs on boards, if the roads cannot be closed.
- Start your own campaign to create awareness about roadkills in your town or city!

Write a small letter with a photograph about any animals you have seen on roads and send it to editorial@sanctuaryasia.com.

LETTERS FROM YOU

THE INBOX

We love hearing from you!

Write in with your questions, thoughts, photos, doodles, poems and more, and we will publish them here. Send to editorial@sanctuaryasia.com

Subscribe to *Sanctuary*

I was invited by Vrikshaa International School, Tirupur, Tamil Nadu for a session with students to celebrate tigers and increase awareness about conservation. I was happy to see their dedication towards conservation. I advised that the school subscribe to *Sanctuary Asia* and *Sanctuary Cub* magazines, and they immediately did so! **– S. Kulasekaran, Director, Nature Skool**

On Kids for Tigers

What a great programme and worthy objectives. **– Tom Kogut**, **USA**

On the Save the Tiger Event at NCPA Mumbai

I had an incredible time at the Anant Bajaj Paryavaran Mitra-Kids for Tigers event! The highlight was being present as a voice to PETA's animatronics elephant, 'Ellie'. We were captivated by the stunning photo exhibition showcasing Sarmaya and Sanctuary's diverse art and wild animal collection. Animal Planet also provided fantastic content to educate the children. It was an excellent opportunity to engage with the most energising members of our country, our Kids for Tigers! **– Dia Mirza, Mumbai**

The excitement was infectious. Enjoyed being there and feeling the positivity. **– Paul Abraham, Mumbai**

ON July 2023 Cover

Excellent image and well-deserving of appreciation. **– Avinash Mayekar, Thane**

ON Take Action July 2023

The *FCA Amendment Bill* will dispossess Adivasis and forest dwelling communities whose land rights were recognised under the *Forest Rights Act* and *PESA*, as *FCA* overrides those provisions and the gram sabha. **– Iq**

Young Shutterbugs

PRATHEETH PAKKA, 19, BENGALURU

Pratheeth is an engineering student at JSSATE Bengaluru. He has been in love with learning about and observing the natural world for as long as he can remember. He finds insects fascinating.

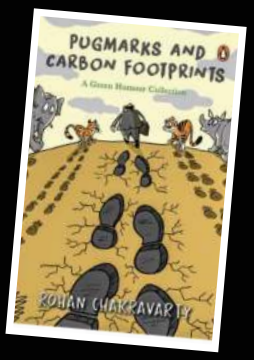
CAMERA Samsung S20FE **LENS** Self-built macro lens

Pratheeth saw this yellow-spotted flower chafer *Protaetia niveoguttata* on a ledge near his garden in Bengaluru. The beetle remained still as a group of ants surrounded it. It did not flinch even as one ant crawled on top of it. Pratheeth found the interaction between the beetle and ants quite beautiful, and that moment, which was fleeting, felt very delicate and surreal, as he clicked the shutter.

Dear *Cub* Kids, wildlife films and books are a wonderful way to get closer to the natural world around us. Here's a book we think you would like!

BOOK NOOK

A Cheer Pheasant talks about chir pine. LGBTQ+ in the animal world. A tiger mom with 'eyes' on the back of her head! This *Green Humour* comic collection is a delight.



From new discoveries to little-known scientific facts, to criticism of lack-lustre global conservation efforts, *Pugmarks and Carbon Footprints* is a collection of comics on environmental issues by brilliant and talented artist Rohan Chakravarty, Sanctuary Young Naturalist Award winner, 2012. These wonderfully-detailed, often hilarious (and sometimes heart-breaking) comics communicate facts on wildlife in a fun, innovative and often relatable way. An Old Western-esque showdown between a wildlife photographer and a quick-flying bird had me laughing out loud! Rohan combines biting sarcasm and humour with well-researched facts in this series that covers the gamut of environmental issues in India today. With comics on overfishing, fun facts about nudibranchs, personal experiences in the wild, and comparing bald patches to butterfly families, this book will appeal to readers of all ages.

AUTHOR Rohan Chakravarty. PRICE RS. 499/-
REVIEWED BY BHAVYA IYER

THE SECRET LIFE OF PLANTS & FUNGI!

Quiet KINGDOMS

A scientific mission to safeguard plant biodiversity in a seed bank!

Two out of five plant species are threatened with extinction and scientists are in a race against time to conserve wild species through seeds. In bomb-proof frozen vaults underground in the British countryside, scientists are preserving seeds of 40,000 wild plant species originating from 190 countries. The project, called the Millennium Seed Bank (MSB), was started in the late 1990s and now has 2.4 billion seeds stored in two locations. Around 20 per cent of the world's flora is preserved here with priority given to endemic and threatened species. Scientists at the MSB say that storing seeds *ex-situ* (away from their natural habitat) and supporting seed banks, ensures a future for some of the world's most threatened plants as it means that the seeds can be germinated and the plants reintroduced in the wild.

PUBLIC DOMAIN/DILIFF

SPACEVEGGIES

PUBLIC DOMAIN/NASA

Vegetable Production System is a space garden on the International Space Station that adds fresh food to astronauts' diet.

EBONY-RETURNS

PUBLIC DOMAIN/JAMES ST. JOHN

The **St. Helena ebony**, once thought to be extinct, was propagated from plants spotted on its namesake island.

DINOSAUR-TREE

PUBLIC DOMAIN/JOHN TANN

The ancient **Wollemi pine** was considered extinct for over two million years until rediscovered in Australia in 1994.

A mangrove forest planted and cared for by villagers is their cyclone protector.

In April 2019, Cyclone Fani caused widespread destruction in Odisha but one village in the state believes it was saved thanks to a 10-hectare mangrove forest. Most people in Badakhot village in Kendrapara district relocated here after their native village of Khirakot was impacted by cyclones in 1971 and 1999. In 2006, environmentalist Bijay Kumar Kabi, reports *Down to Earth*, convinced villagers about the importance of mangroves. They chose common grazing land near water to plant mangroves. With help from the German Agency for International Cooperation, they planted native seeds of *Avicennia, Rhizophora, Sonneratia* and *Kandelia* genera. Now 12 years later, the thriving mangrove forest provides protection from cyclones and floods, firewood and grass, and is home to varied avian and aquatic species.

DHRITIMAN MUKHERJEE

KIDS FOR TIGERS is a nationwide effort of SANCTUARY and school children to save the wild tiger and its habitat.

KIDS FOR TIGERS

THE JULY & AUGUST 2023 REPORT

SCHOOL SPOTLIGHT

Swami Awadheshanand Public School and Junior College, Nagpur.

SAPSJC has a wonderful eco-mission – to nurture young minds to think green! This school has been working with the Kids for Tigers programme to integrate environmental education into the school curriculum. Every year on July 29, students and teachers of SAPSJC celebrate Global Tiger Day. During the celebration, several nature-themed activities are organised, such as mask making, creating posters with environmental slogans, animal face painting, and more. The school also conducts cleanliness drives, and encourages students to make art as 'Best out of Waste'. They recently celebrated World Environment Day by planting medicinal and flowering plants. The students also learned how to sow seeds! SAPSJC aims to mould their students into responsible, eco-conscious citizens.

SANCTUARY PHOTOLIBRARY

For the Wild, For the Tiger

First initiated in 2010 at the Saint Petersburg Tiger Summit in Russia, Global Tiger Day is celebrated on July 29 each year to raise awareness about tiger conservation. To mark this day, celebrations are held in several cities across the country! In Nagpur, this year, a festival was organised at the VR Mall. Over 330 students and many parents and teachers from 29 schools took part in the event and participated in various activities such as face painting and animal fancy dress. In Bengaluru, another event was conducted by Kids for Tigers, with international wildlife conservation expert Vance Martin attending alongside Sanctuary's founder, Bittu Sahgal. In Ranthambhore, government school kids watched a film on wildlife conservation, and took part in a drawing competition. The kids then planted saplings of *gulmohar*, *shisham* and *kachnar*, and vowed to care for the trees!

SANCTUARY PHOTOLIBRARY

SANCTUARY PHOTOLIBRARY

Global Tiger Day was celebrated in Bengaluru with a huge crowd and lovely wildlife-themed art installations such as this pangolin, created by students out of recycled material.

KIDS FOR TIGERS GLOBAL TIGER DAY!

From jellyfish to peafowl, lions to owls, kids were arrayed in a rainbow of colours, with their innovative costumes representing different wildlife species!

SANCTUARY PHOTOLIBRARY

SANCTUARY PHOTOLIBRARY

Face painting is a favourite activity at Kids for Tigers' events, and a chance for students to recreate life-like animal portraits!

SANCTUARY PHOTOLIBRARY

Kids for Tigers took over Nagpur's VR Mall for Global Tiger Day Celebrations, in a fun-filled event that drew curious citizens.

SANCTUARY PHOTOLIBRARY

One of the winning entries in the Wildlife Poster competition skilfully mixed colour and an emotive appeal to protect our national animal.

SANCTUARY PHOTOLIBRARY

Students created beautiful drawings and paintings on the theme of saving the tiger and other wildlife, combining art with conservation.

JOIN KIDS FOR TIGERS! Email amandeep@sanctuaryasia.com for more info.

DID YOU KNOW?

Watercrafts that survived the test of time for thousands of years.

A 10,000-year-old hollowed out log of the Scots pine tree is the oldest surviving boat in the world. The little vessel was found accidentally by a local farmer in 1955 near the village of Pesse in the Netherlands, when a road was being constructed. The Pesse canoe is three metres long and 44 cm. wide; it is now exhibited at the Drents Museum in the Netherlands. The prehistoric dugout canoe, which had been carved with an axe, survived because it was buried in peat. To find out if the log was truly a watercraft, a replica was tested and found stable. It was compared with the Dufuna canoe, an 8,500 to 8,000 year-old boat found in 1987 in Nigeria. Both the canoes were found to have similar markings and shape, proving that the Pesse vessel was indeed a boat. The 8.4-m.-long Dufuna canoe was also found accidentally by a cow herder.

PUBLIC DOMAIN

SUPER DIVERS

PUBLIC DOMAIN/POLAR CRUISES

The **Emperor Penguin**, the deepest diving of all seabirds, can dive up to 535 m. in pursuit of prey such as deep-dwelling squid.

SPACE FLIES

PUBLIC DOMAIN/SANJAY ACHARYA

Fruit flies were the first animals sent to space in 1947. They returned safely to Earth after being launched up to 109 km.

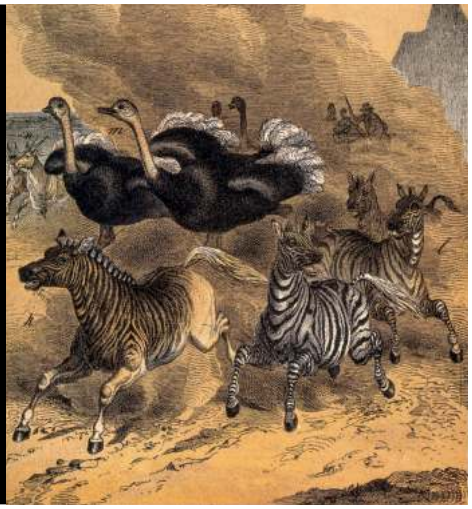
SWIMATHON

PUBLIC DOMAIN/GLENN EDNEY

Humpback whales travel 16,000 km. between their feeding and breeding grounds – the longest mammal migration!

I got your back! Other-species-buddies work together for mutual benefit.

Despite being different species, ostriches, the fastest running birds, and the gorgeously monochromatic zebras pool their senses to win at life! Ostriches have fantastic eyesight – they can see a moving object as small as a dog three kilometres away during the day. However, their hearing and smell are comparatively poorer. The zebra compensates for this – it has great ears and a nose. Though both animals can run fast, they still have to be alert to escape predators that may outrun them. So, the bird and ungulate work together to stave off pack animals such as hyenas and leopards by warning each other. This inter-species relationship, where both species are benefited by each other's company, is known as mutualism.



PUBLIC DOMAIN

SURF'S UP

'Surf's up' is a phrase used by surfers before they jump on a good wave. It's time we go along for the ride!

Deep-sea mining will disturb the fragile deep sea environment.

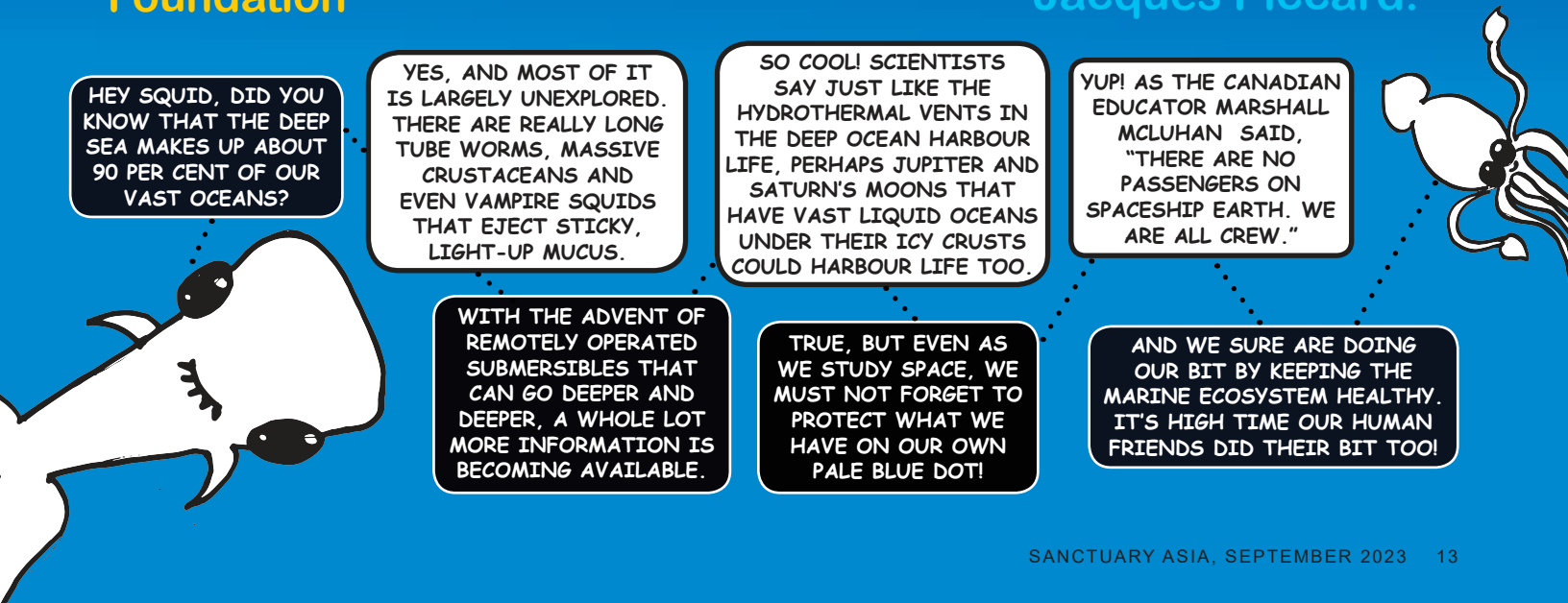
The deep sea, a major part of Earth's biosphere, is not a barren plain of sand and rock but is teeming with a diversity of life. It plays an important part in the global carbon cycle. Yet, governments around the world are approving deep-sea mining projects for minerals. This could disturb the fragile deep sea environment with staggering impacts for our oceans, marine life and all of us who depend on them. Let's remember the wonder we felt on seeing the famous 1968 Earthrise photo taken from the Apollo 8 spacecraft showing the Earth emerging behind the moon, or the 'blue marble' photo taken by Apollo 17 in 1972. If we act now, we can save our oceans and our planet.

PUBLIC DOMAIN/NOAA

PUBLIC DOMAIN/GLOBAL SEA MINERAL RESOURCES

In the Clarion-Clipperton Zone of the Pacific Ocean, where deep-sea mining is proposed, 70-90 per cent of the species that have been collected are new to science. – Environmental Justice Foundation

"We are on Spaceship Earth. We all own the health of the oceans. It takes a village to save the world." – Lieutenant Don Walsh, explorer and deep-sea diver, first to reach the deepest known part of the Earth's seabed with Jacques Piccard.



Cub News

SEPTEMBER WILDLIFE AND ENVIRONMENTAL NEWS FROM INDIA AND AROUND THE EARTH 2023

Seventy-eight bird species are found only in India.

India is home to 78 species of birds that are not found anywhere else in the world! These include the Nicobar Serpent Eagle *Spilornis klossi* and Andaman Barn Owl *Tyto deroepstorffi* from the Andaman and Nicobar Islands, and Malabar Grey Hornbill *Ocyceros griseus* and Malabar Parakeet *Psittacula columboides* from the Western Ghats. Interestingly, the list also includes three birds that have not been seen for several years – the Jerdon's Courser last seen in 1876, the Manipur Bush Quail in 1907, and the Himalayan Quail in 2009.

Barring these three, the Zoological Survey of India has released a book that features the remaining 75 species with information about their habitats and characteristics. ZSI's publication *75 Endemic Birds of India* marks India's 75th Independence year Among the 78 Indian endemic bird species – five per cent of the total bird species found in the country – are 11 that are 'near threatened' and 25 that are classified as threatened on account of their low numbers. Of the 25 threatened species, three are 'critically endangered', five are 'endangered', and 17 are 'vulnerable'. The total number of recorded species in India is 1,353, which represent 12.4 per cent of the global bird diversity, which stands at 10,906 species. Global bird populations are declining owing to human activities. It is important that bird habitats, especially of endemic species, are protected.

Of the 78 endemic Indian species, 25 are categorised as threatened.

The endemic Nicobar Serpent Eagle is threatened by habitat loss.

PUBLIC DOMAIN/M. V. SREERAM

Ancient ocean found in Kumaon Himalaya.

Scientists of the Bengaluru-based Indian Institute of Science (IISc) and Niigata University, Japan discovered droplets of water within mineral deposits in the Himalaya, the roof of the world, which likely were part of a 600 million-year-old ocean. The search extended across the western Kumaon Himalaya.

The deposits are being used to understand the state of the planet in that period – for example, about why there was a huge oxygenation event on Earth. The oceans were deprived of calcium owing to lack of river flows, an ideal condition for the growth of cyanobacteria, which generated vast amounts of oxygen. This likely led to the Second Great Oxygenation Event. During this event, concentration of oxygen in the atmosphere and shallow oceans rose dramatically; the changed composition of gases on Earth led to the formation of complex life forms. An increase in oxygen in the atmosphere always leads to evolution. The marine rocks could also reveal climatic conditions then, which could in turn help in creating climate models for current times.

PUBLIC DOMAIN/NASA

Amazon deforestation lower in 2023.

The Amazon rainforests in Brazil have received a repreive under President Luiz Inácio Lula da Silva, who took charge at the beginning of the year. There has been a 66 per cent reduction in deforestation this July compared to July last year. President Lula has been taking steps to put back in place protection for the Amazon, and also bringing in international support for these critically vulnerable rainforests.

PUBLIC DOMAIN/NEIL PALMER/CIAT

Coexisting with tigers as numbers rise.

PUBLIC DOMAIN/WIKIPEDIA

The tiger population in Bhutan has increased by 27 per cent since 2015. There are now a total of 131 tigers estimated here, owing to the nation's commitment to conservation. Increased tiger numbers in turn lead to an increase in forest cover.

On the other side, Nepal is focusing on bettering connectivity for tigers and making human-tiger coexistence possible. The country has tripled its tiger population in the last 12 years; there were 355 wild cats as of 2022. Nepal has done this by providing predator-proof pens for livestock, and establishing wildlife corridors. Experts believe such measures, along with compensation for wildlife depredation and involving the locals will also be required in Bhutan.

Rare deep-sea octopus nurseries spotted.

In June 2023, scientists found two deep-sea octopus nurseries with hatchlings at Dorado Outcrop, a seamount (underwater mountain formed by volcanic activity) near the coast of Costa Rica. These are a rare find as they are two of the only three nurseries known in the world; the third is near the coast of California at Davidson Seamount. The scientists had first seen female octopuses with eggs, but no hatchlings and had assumed that this was because the water there was too warm and lacking in oxygen. This particular octopus species is yet to be identified. While very little is known about deep-sea octopuses, scientists do know that females do not leave their eggs or eat while brooding.

PUBLIC DOMAIN

Indian Railways speeds towards solar.

The Central Railways of the Indian railway network is gathering speed to go green – they have begun working towards generating one megawatt (MW) of solar units and have identified 2,700 acres to set up solar plants to reduce their carbon footprint. This is part of their plan to install solar plants on vacant plots. Central Railways is also adding solar rooftop panels at many of its stations. In Europe, the train operator Thalys is operating trains in Belgium, France and Germany on 100 per cent green energy from 2020.

PUBLIC DOMAIN

Bangladesh's medicinal plant farming increases.

Medicinal plants have been thriving in Bangladesh thanks to a new understanding of herbal medicine in the medical industry in the country. Not only are the locals not cutting medicinal trees, they are also planting them. Key to this revival have been the traditional herbal medicine practitioners known as *kabiraj*. Their commercial value has made cultivation viable.

PUBLIC DOMAIN/S. MOJUMDER/DRIK/CIMMYT

INDIAN IDOL

Meet the symbolic species of the biodiverse state of Sikkim!

The second smallest Indian state, Sikkim covers only 0.2 per cent of India's geographical area. Low in human population, Sikkim is, however, incredibly high in biodiversity, making it an important hotspot within the Eastern Himalaya. Sikkim is situated within the Himalayan Biogeographic zone, encompassing the Central Himalaya biotic province. This region boasts approximately nine distinct forest types, as classified by Champion and Seth. The state stands out for its diverse ecosystems, encompassing both alpine and subtropical climates.

Every state and territory in India has their own symbols, which include an animal, bird, tree, flower and butterfly. These flagship species are often selected as a state representative and they hold cultural and historical significance to support their conservation.

PUBLIC DOMAIN/WIKIPEDIA

STATE ANIMAL

SMITA BEHERA/SANCTUARY PHOTOLIBRARY

Over 300 **red pandas** are found in Sikkim. These arboreal mammals feature on the state Forest Department's coat of arms.

STATE TREE

PUBLIC DOMAIN/DR. A. J. T. JONSINGH

Rhododendron niveum, an endemic species with deep magenta or lilac flowers, is rare and threatened in the wild.

STATE BIRD

PUBLIC DOMAIN/DIBYENDU ASH

The **Blood Pheasant** male has a crimson-tinged face, breast and tail, while the female has an orange face and brown plumage.

Read about these wonderful species and why they are Sikkim's symbols.

Sikkim is a hilly state in Northeast India. Nearly 47 per cent of the state comes under a Protected Area, which includes the Khangchendzonga Biosphere Reserve (a UNESCO World Heritage Site) and seven other wildlife sanctuaries. Sikkim is home to a variety of animals from the endangered red panda, to the massive Himalayan black bear, the elegant snow leopard and high altitude bharal or blue sheep. The cold desert in north Sikkim is home to high altitude species such as the Tibetan wolf, Tibetan wild ass, and the elusive Pallas' cat. It is also home to some of the most beautiful butterflies of India, including the state butterfly blue duke, Sikkim yellow gorgon and the Kaiser-e-hind. The state flower is the noble dendrobium, a species of orchid with colourful blossoms.

PUBLIC DOMAIN/MAJA DUMAT

THE GALLERY

Nature has inspired artists for at least 45,000 years. The oldest known cave painting is of three wild pigs!

Artwork that views Planet Earth from beyond our perspective on the ground.

PUBLIC DOMAIN

Dymaxion Map
by R. Buckminster Fuller
The only flat map of the Earth's surface that shows our planet as one island in one ocean without visual distortions in terms of size or shape and without breaking them up into continents, it was created over several decades. It was revealed in 1954 after Fuller felt it represented a "satisfactory deck plan of the six and one half sextillion tons Spaceship Earth". Fuller used the term 'Spaceship Earth' to showcase Earth's inhabitants as a collective force. The map was updated by Shoji Sadao in 1982.

PUBLIC DOMAIN

Spaceship Earth Mural by Claudio Mazzoli Italian artist Mazzoli created this mural at the entrance to Spaceship Earth at EPCOT, the Disneyland park.The stunning mural, a favoured photo-backdrop for millions of visitors, shows the importance of communication – about where we came from and where we are going. The mural provides a wonderful entrance to EPCOT's flagship attraction – the iconic geosphere that showcases landmark moments of amazing innovation using advanced Audio-Animatronics figures.

PUBLIC DOMAIN

The Third Paradise by Michelangelo Pistoletto In the traditional infinity symbol, the first circle symbolised the past and the second the future, with the present being a small point at the intersection. For Pistoletto, the present allows us to create, act and change and he did not want it to be fleeting. He wanted to depict a third space to represent the present as the moment to act, imagine, create and realise. In this space, he added representation of life – whales, flowers, vegetables, and manufactured objects.

DO IT YOURSELF.

D.I.Y.

MAKE YOUR OWN TIME CAPSULE!

Make your own time capsule for a blast from the past as a gift to your future self! You can include letters, photos or anything you like.

Materials. Gather envelopes, paper, photos, your stationary of choice like pens, pencils, or sketch pens. Find a large, durable container – a glass jar, or recycle a plastic or tupperware box, that has been cleaned and dried.

PUBLIC DOMAIN

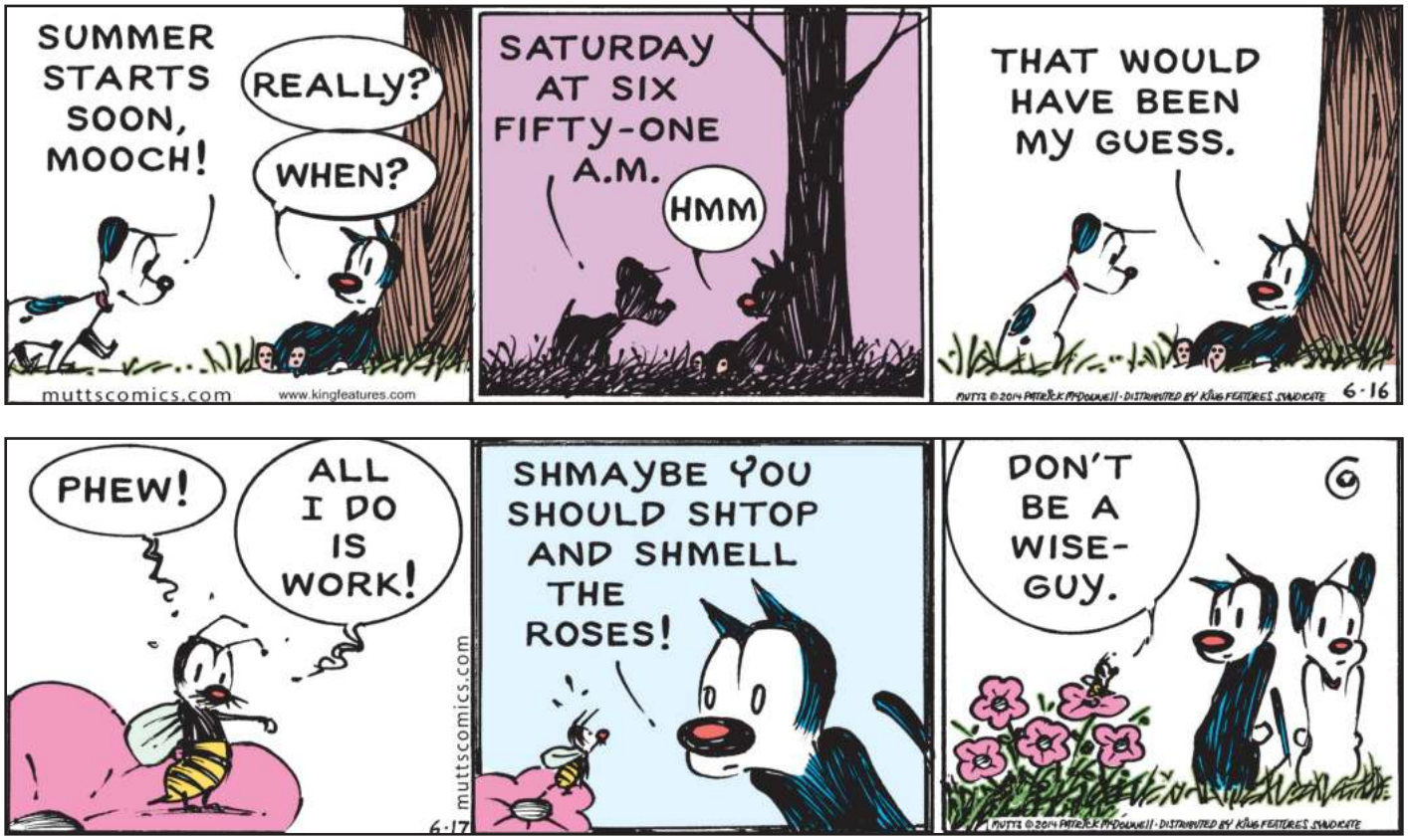
Prepare. Write letters to your future self – one year in the future, five years, and 10 years in the future. Write about what you hope life will be like, your hopes and dream for the planet, add photos or anything else! Seal the letters in an envelope, addressed to your future self.

Time travel. Place envelopes in container, and seal. Keep the time capsule somewhere safe and dry, and open it only at the specified time! You can also place new letters each year.

PUBLIC DOMAIN

MUTTS

By Patrick McDonnell. Since 1994, MUTTS has dealt with themes ranging from animal protection, love and kindness, to art and artists, highlighting many of the important issues that the world faces, including wildlife and environmental conservation. For more MUTTS, please visit www.muttscomics.com



WILD Encounter

Nestled in the boughs of a mango tree, this Indian palm squirrel, also called the three-striped palm squirrel *Funambulus palmarum,* appeared to want to expand its palate. While peering through the foliage, it found a new buffet laid out for it – the fruits of a nearby neem or margosa tree! After giving the photographer a curious look from its original perch, the squirrel leaped a grand distance of nearly 10 m. to the margosa tree, where it settled down for a meal of the fleshy fruits. Squirrels are rodents, and this particular species is native to India and Sri Lanka. While they feed predominantly on fruits and nuts, being omnivorous, they also consume insects, small mammals, reptiles, eggs, and occasionally even the chicks of birds. **– Saraswata Chaudhuri, 20, Kolkata, Student at IISER Mohali**

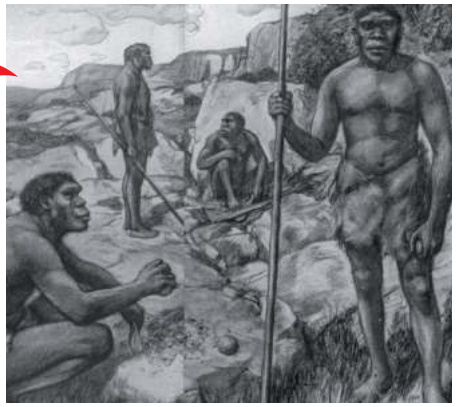
An Indian palm squirrel peeks out from the midst of foliage.

HUM Animals

There is no 'US' and 'THEM'! All lifeforms on earth share a common ancestor. We must study 'Evolution through Natural Selection' – no longer considered a 'theory' but rather a fact – to get to know ourselves better!

Ancient sea-farers: Humans have been sailing across oceans for a million years!

Stone tools and bones found in Eurasia show that much before modern humans *Homo sapiens*, early members of the human family had started crossing the oceans and reaching previously unoccupied land. Several Greek islands, which could only have been reached by crossing seas, have stone tools that resemble the ones used by *Homo erectus* a million years ago. In Indonesia *H. erectus* crossed several kilometres of deep waters over a million years ago to islands such as Flores and Sulawesi. Scientists believe that this could have happened by accident when humans were swept into the sea owing to tsunamis.



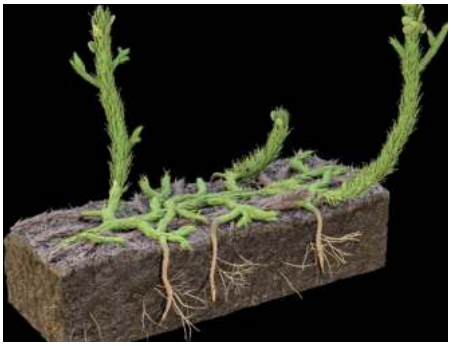
PUBLIC DOMAIN/AMEDEE FORESTIER

About 3,000 Southeast Asians were likely the first humans to reach Australia 40,000 to 50,000 years ago. They became the founding members and the ancestors of the Aboriginal people of Australia. Researchers believe that they had ventured out with the intention of exploration, sailing to Sulawesi from Borneo and then island-hopped to New Guinea, to the north of Australia.

PUBLIC DOMAIN/WIKIPEDIA

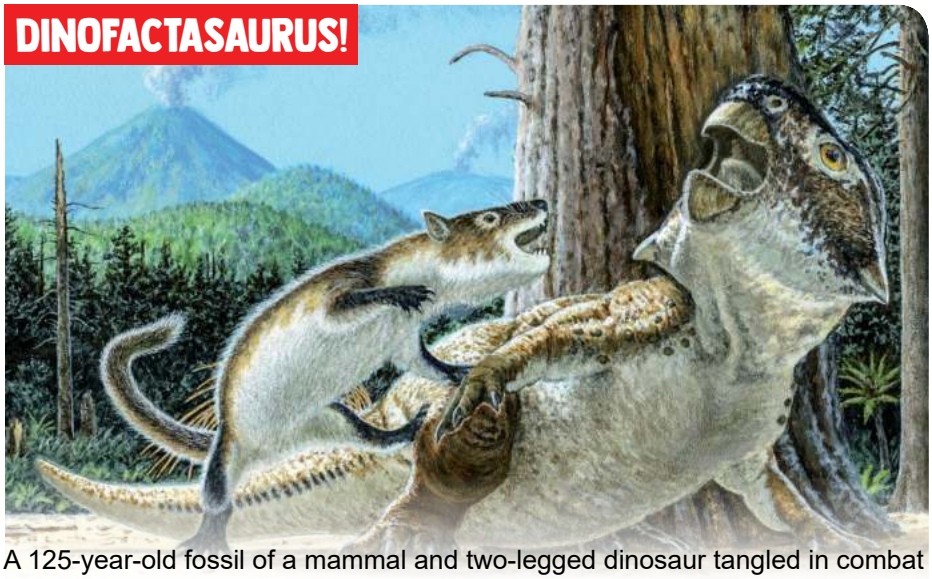
Fossil discoveries of varied hominins including the hobbit-like *H. floresiensis* suggest that Earth was not unlike J.R.R. Tolkein's 'Middle Earth'.

A 3D model of *Asteroxylon mackiei*, a 407-million-year-old plant fossil, shows that non-Fibonacci spirals were common in ancient clubmosses. It was assumed that the Fibonacci sequence, observed in sunflower heads and pinecones, was an ancient feature in ancient land plants, and was highly conserved. The non-Fibonacci is rare in plants today.



PUBLIC DOMAIN

DINOFACTASAURUS!



PUBLIC DOMAIN/MICHAEL SKREPNICK

A 125-year-old fossil of a mammal and two-legged dinosaur tangled in combat shows that the food web in the Mesozoic era was much more complex. The cat-sized four-legged mammal *Repenomamus robustus* is latched onto the larger, dog-sized *Psittacosaurus lujiatunensis*. There has never been an example of a mammal preying on a dino before. The animals were preserved when they were engulfed in a sudden volcanic eruption. The Repenomamus is a carnivorous predator and one of the largest mammals in the dinosaur age, while the Psittacosaurus fed on plant material using its parrot-like beak.

A Day at the Museum.

I visited the Natural History Museum at Tring and pulled out a drawer filled with bird 'specimens'. As an ecologist studying grassland birds, I study museum collections to understand where grassland birds were collected. Text and images by Sutirtha Lahiri.

TRAIN TO TRING

It was a usual day at the museum that took an interesting (and nostalgic) turn. Like the past two weeks, I took the train to the Natural History Museum (NHM) at Tring, signed in, climbed to the 2nd floor, and pulled out a drawer full of bird 'specimens' – dead birds stuffed and preserved for scientific study. As I was going through a cabinet of Slender-billed Babblers – a grassland bird restricted to the lowland grasslands of India and Nepal – I was in for a surprise; there was a specimen with the label 'Coochbehar'. I had mixed feelings; happy that a rare and restricted bird was collected from my hometown (in northern West Bengal), yet sad that it hasn't been seen in my state for the past 73 years.

The NHM, which houses the world's largest collection of preserved birds, with 750,000 specimens from 95 per cent of the world's bird species is located in Tring, a town one hour North of London, U.K. As an ecologist studying grassland birds in India as part of my Ph.D. work, I wanted to tap into this vast resource to understand where grassland birds have been collected in the past. These specimens are made through a process of taxidermy – where any wet tissue is removed from the body, the outer feathers are washed and dried, and the bird is then stuffed with cotton and stitched. Care is taken to

SUTIRTHA LAHIRI

Different species of rare and endemic grassland birds, preserved as specimens at the museum.

Natural History Museum at Tring, London, U.K.

SUTIRTHA LAHIRI

The Pink-headed Duck is believed to be extinct since the 1950s.

SUTIRTHA LAHIRI

The author studied grassland bird specimens at the museum for his Ph.D. research.

SUTIRTHA LAHIRI

ensure there is no insect infestation. They are then stored in humidity and climate-controlled rooms, in large drawers, and grouped and arranged in a very meticulous manner based on species classification.

SCIENCE THROUGH HISTORY

Historical information on birds that are endangered can help understand how bird distributions have changed over the past decades. Scientists throughout the world are tapping into museum collections to get a hint at the past, to try to understand species distribution – where species were once found – including for species that are now extinct. To do this, researchers rely on the paper tag that is attached to every specimen. This tag contains a wealth of information – who collected the bird, where and when it was collected, measurements, and any other information that the collector could squeeze in. In my two weeks as a visiting researcher, I had the good fortune of working with many such specimens, including of birds that are now considered extinct, such as the Pink-headed Duck (last recorded in Bihar in 1935), the Himalayan Quail, and the Manipur Bush Quail. All these historical specimens had a story – a story of diversity, and how rampant global anthropogenic changes are making more and more species go extinct.

Museums offer a chance to study so much more. Scientists are tapping into preserved bird nests to study their elaborate structures, studying egg colour diversity and how they vary in different areas, analysing various aspects of a bird specimen – from CT-scanning bills, to measuring plumage colouration and pigments – the possibilities are endless.

MUSEUMS TO THE RESCUE

In recent times, museums have vastly increased our understanding of how global climate and land-use change is affecting birds. Analysing specimens collected over 40 years, researchers have found out that, with increase in global temperatures, North American birds are decreasing in size! They help us understand how habitat fragmentation might affect connectivity in different populations of birds. Imagine being able to extract DNA from a bird collected more than 200 years ago – now possibly even extinct – to answer these longstanding questions.

Museum specimens help us study diversity in bird body sizes, like the smallest and largest hummingbirds in the world, pictured here: the Bee Hummingbird (left) and the Giant Hummingbird (right). Centre: Black-thighed Falconet.

SUTIRTHA LAHIRI

Working at a natural history museum is equal parts fun and nostalgic. Holding a bird in your hand – one that is extinct in the wild – might induce a lot of dismay at the failure of powerful entities to protect our biodiversity. At the same time, it also invokes curiosity to do more, to understand these species to do something about it. As they say, a bird in hand is certainly worth two in the bush!

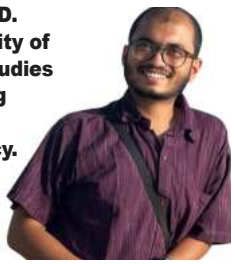
TIPS ON VISITING MUSEUMS

~ Research the museum before visiting, so you can prioritise the collections you want to see first!

~ Take a notepad and pen with you to record interesting facts, and research more once you get home!

~ Contact a curator prior to visiting, as museums require special access for collections beyond public displays.

Sutirtha Lahiri is a Ph.D. student at the University of Minnesota, USA. He studies grasslands, integrating his love for birds, conservation and policy. He is also a freelance writer, focusing on natural history and conservation.



SPACESHIP EARTH

The Overview Effect: When astronauts see the beauty of Earth from space.

Yuri Gagarin was the first person to shoot up into the skies to journey into space, in 1961. Gagarin came back changed, with an entirely different view of our home planet, the Earth, and a new appreciation for its beauty. This sentiment has been expressed hundreds of times since by many astronauts. This awe and appreciation for Earth, inspired by space flight, has been termed 'The Overview Effect'. Astronauts who glimpse our beautiful blue planet return with a passionate appreciation for our ecosystems, and a desire to preserve it. A photo taken by the crew of the Apollo 17 spacecraft on their way to the moon, showing Earth from the Mediterranean Sea to Antarctica became famous. Called 'The Blue Marble', it became a symbol of the environmental movement to preserve the Earth's fragile balance.

PUBLIC DOMAIN/NASA

LOL

What makes the Earth so great?
It's well-rounded.

Why didn't the sun go to college?
Because it already had a million degrees.

How can you tell the planets were angry at the sun?
They started a revolution.

Are we made of stardust?

PUBLIC DOMAIN/NASA

All lifeforms on Earth, at the most basic level, are primarily made of the elements carbon, hydrogen, oxygen, and nitrogen. These elements were created when stars explode into 'supernovas'. Carbon and oxygen are created inside stars. These starry elements make up our universe – and eventually made us!

FAR-OUT SPACE FACT!

PUBLIC DOMAIN/MADELGARIUS

Exploring space in the age of the anthropocene Space has become the new frontier for many billionaires, from Jeff Bezos to Elon Musk. Some believe we should focus on repairing the damage we are doing to our environment, instead of searching for new planets to pollute. Others are intent on diving into the ocean – the submersible *Titan* exploded while exploring the wreckage of the *Titanic*, killing all onboard. Such trips create a lot of waste, and do not increase our understanding of the ocean or space; instead of feeding billionaires' egos, we should focus on restoring Earth's habitats first!

Exploring Life Beyond Earth: Do Aliens Exist? What Might They Look Like?

So far, we have no concrete evidence that life exists beyond Earth. However, that hasn't stopped people from theorising what aliens might look like! From the human-like Vulcans of *Star Trek*, to the fungus-like lifeform from *The Expanse*, to E.T and Jadoo, aliens are imagined differently. This also gives rise to wacky theories! Some claim to have been 'abducted' by aliens. Some believe life on Earth had an extraterrestrial (alien) origin! The universe is vast, and until we discover alien life, or they reach out to us, we can't know for sure.

PUBLIC DOMAIN/PABLO CARLOS BUDASSI

WhalesomeRescue

A sperm whale was stranded near Karaikal Port, Puducherry. Fishermen, and Port and Fisheries Department officials joined the Wildlife Department in the rescue. BY VANJULAVALLI SRIDHAR

ALIVE AND FLOATING

Less than a few hundred metres from the sandy beach, the sperm whale's black, glossy back was clearly visible amidst the waves. I had received information that morning of May 13, 2023 that a poor whale was beached and dead near Karaikal Port in Puducherry, and the carcass would have to be buried. Even if it had not been dead, a beached whale would need to be euthanised according to protocol, because it suffers sun burns and its organs are badly damaged simply from the weight of the animal on land. Luckily, I realised that this individual, of about 13 m. and 15,000 kg., was simply stuck, and was breathing and moving about. I was elated! It had probably been pushed too close to the coast by the high tide.

LARGEST TOOTHED PREDATOR

The sperm whale *Physeter macrocephalus* is a carnivorous mammal. It has the largest brain among all creatures on Earth, inside its enormous square head. The whale's head holds spermaceti, a mysterious fluid that scientists have still not understood. They can dive to 350 m., staying underwater for an hour. It is the largest toothed predator, and was targeted for whaling in the 18th and 19th centuries for oil and ambergris (a waxy substance in its intestine used in medicines and potions). The titular character of Herman Melville's novel *Moby Dick* was a mythical albino sperm whale.

COURTESY VANJULAVALLI SRIDHAR

PUBLIC DOMAIN/GABRIEL BARATHIEU

AT SEA WHERE IT BELONGS

As soon as I realised the whale was alive, we swung into action. The Department of Forest and Wildlife in Puducherry functions with a skeletal framework; two of our staff were present. In light of this, the enthusiastic response of locals and other departments was a game-changer – 13 fishermen from Pattinacherry village joined to help, as did the Fisheries Department and 24 Port members. The fishermen brought rope, and the Port authorities gave us their survey boat without any worry of the expensive equipment on board. Despite the summer sun beating down mercilessly on the group, the operation continued non-stop from 11.30 a.m. to 6.30 p.m. Port divers jumped into the waters and secured the sperm whale with the rope in their fifth attempt amidst the surging waves. It was then pulled out to three nautical miles from the shore. The rope was cut, and we left only after the whale moved. Rescuing the sperm whale was a strenuous operation that turned out to be very fruitful because of the collective understanding of the committed team present there.

Vanjulavalli Sridhar has been an officer in the Indian Forest Service since 2012. She is currently the Conservator of Forests and Chief Wildlife Warden, Department of Forests and Wildlife, Puducherry, and has a Masters in Wildlife Biology and Conservation.

GREEN PEEPS

Meet Soham Kacker, 22, plant scientist, conservation student, and writer.

COURTESY SOHAM KACKER

What inspired you? As a young boy I visited my family's ancestral coffee estate in the Western Ghats in Karnataka. Witnessing the plant world in all its glory made me curious about how plants grow, and how they interact with each other and the world around them. I took every opportunity to grow whichever plants I could on my small city balcony, and observe them closely. I found that plants lived incredibly interesting and complicated lives, if only we looked closer! Later as I studied ecosystems and communities in school and college, I found myself wanting to study plants as they function in connection with their surrounding habitats. This curiosity has guided my studies in Biology and Environmental Science!

Tell us about your work? As a student of plants and the ecosystems they comprise, my research focuses on how plants behave as individuals, and as parts of communities such as forests. When asking questions about how forests work, we often end up finding out about how closely our own lives are intertwined with the growth and health of the forest. Ecosystems are very complex, with many organisms interacting with each other, including with humans – so when we disrupt any of these relationships, we disrupt our relationship with them as well. Through my research, I help understand these relationships so that we can better protect them, and ourselves. While research is important, I believe communicating it is even more so! Through my writing I hope to help people see plants the way I do – dynamic and interesting. I believe that when we learn to understand plants, their world, and their language, we renew our link with the ecosystems from which we often feel separated. Plants are resilient, innovative, and beautiful yet efficient – attributes that can help humans tackle the problems we face in our lives, both individually and as a species.

Tell us a bit about your future plans. I hope to be able to study ecosystems in greater depth during my Master's programme in biodiversity and conservation. I think people often forget that humans are part of the landscape they try to protect, and I hope to bring this perspective to my research and conservation work. I also want to expand my writing to be able to better communicate stories from the plant world, especially our intimate connection with plants. I also want to write specifically for children, as I believe that fuelling their curiosity towards plants will ensure the longevity of our relationship with plants.

COURTESY SOHAM KACKER

Books that influenced you? *The Diversity of Life* by E.O. Wilson; and *The Plant Messiah* by Carlos Magdalena have been highly influential. I would recommend that kids read all books by Gerald Durrell, *My Husband and Other Animals* by Janaki Lenin and *The Hidden Life of Trees* by Peter Wohlleben.

Any documentaries that you would recommend *The Private Lives of Plants* and *The Green Planet*, presented by David Attenborough (BBC) are at the top of my list.

A favourite quote? "And into the forest I go, to lose my mind and find my soul", by John Muir is exactly what I seek to do.

What gives you hope? Curiosity gives me hope, especially when young people become curious about nature.

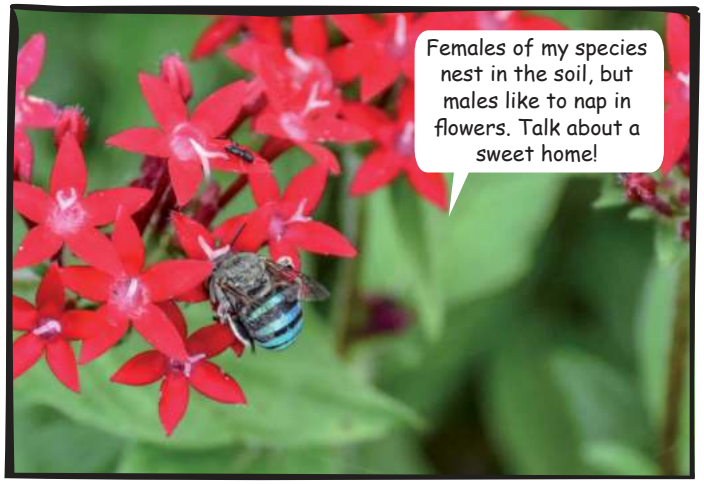
Advice for young people? Do what makes you happiest, and don't be afraid of getting your hands dirty!

CONNECT WITH SOHAM KACKER!

Instagram: @sohamkacker
Email: sohamsadashivkacker@gmail.com

Busily Buzzing About

At Tarahunise lake near Bengaluru, I heard a buzzing sound and spotted a tiny, swift, iridescent blue bolt of lightning hovering around. This flitting little beauty, the blue-banded bee, was active all day. The female is an important pollinator of fruit and vegetable plants and the tropical rainforest understorey since it nests on the ground. **By Shalini Jai.**



Blue-banded bees are a species of solitary, ground-dwelling bees that are found in Asia and Australia. Named for the blue-bands on their abdomen, they are important pollinators.

I am a programmer by profession, based in Bengaluru, and a photographer by passion, with a keen interest in different animal behaviours. I am a firm believer of finding nature all around us no matter where we are.

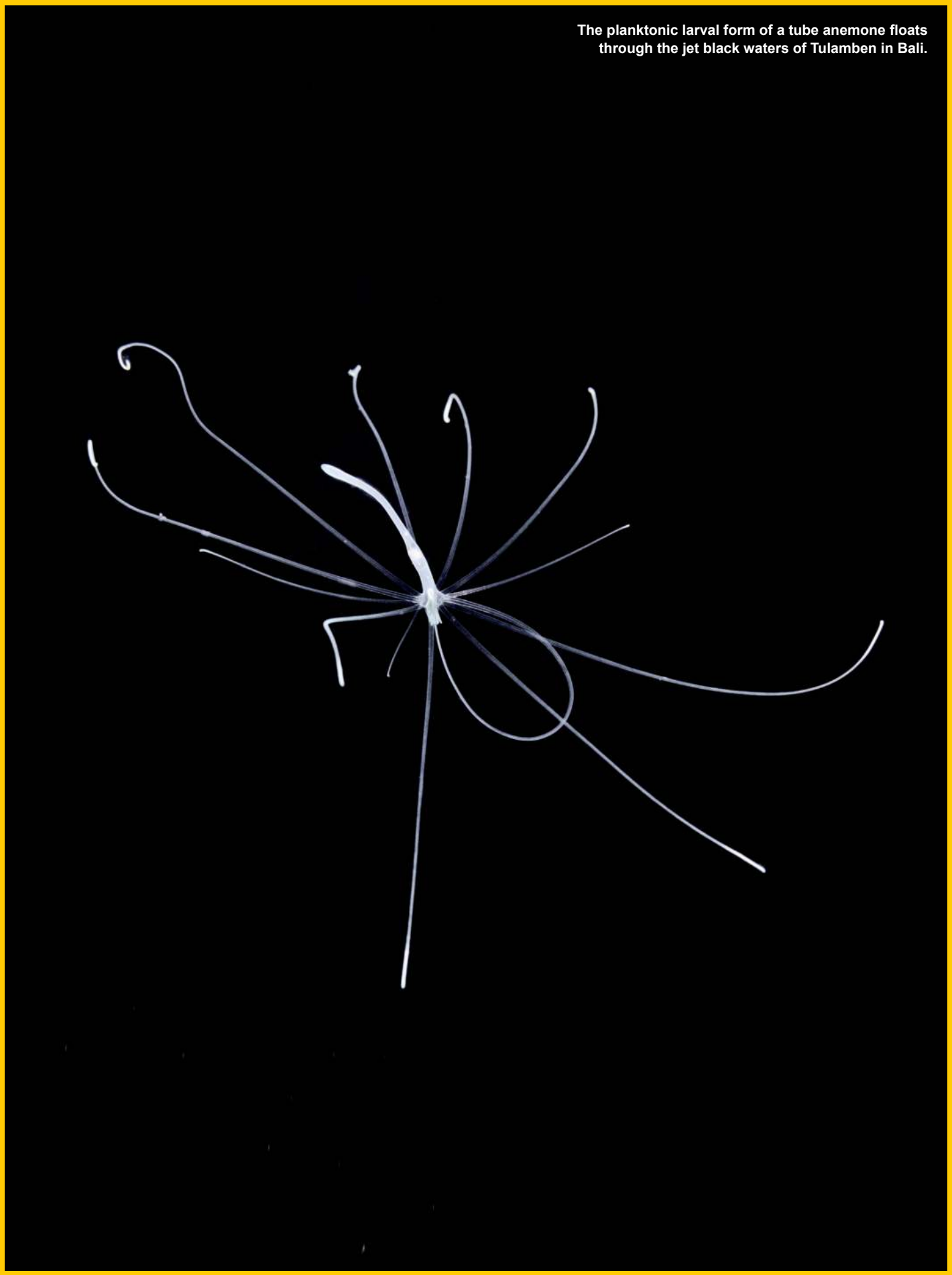
They Live Among Us.

The diversity of life transcends human knowledge – many of our co-passengers on Spaceship Earth can be strange-looking!

What does alien life look like? Would aliens be humanoid, like us? More likely, alien life, if it exists, would resemble some of the stunning, if odd, creatures that inhabit our planet. From radial symmetry to multiple limbs, iridescent colours and scaled skin, the diversity of lifeforms on Earth is mind-boggling. The photographs in these pages present an ensemble of the most 'alien' life that Earth has to offer.

Octopuses are highly intelligent Cephalopods and have been recorded using tools. Each octopus arm has its own mini 'brain'!

DIGANT DESAIZ/SANCTUARY PHOTOLIBRARY



The planktonic larval form of a tube anemone floats through the jet black waters of Tulamben in Bali.

SANDIPAN DUTTA/SANCTUARY PHOTOLIBRARY

A bejewelled-looking caterpillar of the *Trypanophora* moth in Narayanpur in West Bengal.

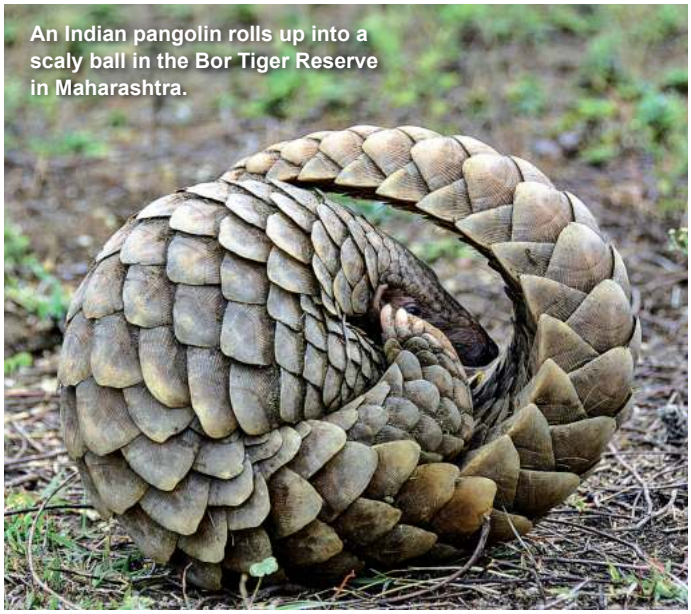
ARINDAM SAHA/SANCTUARY PHOTOLIBRARY

An ant feeds on nectar secreted by a treehopper nymph and provides protection in turn.

AGNISWAR GHOSAL/SANCTUARY PHOTOLIBRARY

The giant egret flower is a fragrant ground orchid found in the Western Ghats, Himalaya and Myanmar. With its feathery shoots, it resembles a bird in flight.

PUSHKAR ACHYUTE/SANCTUARY PHOTOLIBRARY



An Indian pangolin rolls up into a scaly ball in the Bor Tiger Reserve in Maharashtra.

AMIT DUTTA/SANCTUARY PHOTOLIBRARY

Snail-mimic spiders have evolved to resemble snails and bird droppings to remain undetected by predators.

SANDIP CHATTERJEE/SANCTUARY PHOTOLIBRARY

What appears to be the bizarre-looking eye of an amber snail is actually a parasitic worm, *Leucochloridium*, which now controls its brain.

PRAJWAL ULLAL/SANCTUARY PHOTOLIBRARY

Worker ants carry away an *Ophiocordyceps*-infected queen ant, to prevent spread of the fungus in the colony.

APURV DILIP JADHAV/SANCTUARY PHOTOLIBRARY

A piece of history. The mugger or marsh crocodile evolved at least 4.19 million years ago, and inhabits freshwater habitats.

MIHIR JOSHI/SANCTUARY PHOTOLIBRARY

A lobster moth caterpillar feeds on a leaf while showing off its long spindly legs in Satara in Maharashtra.

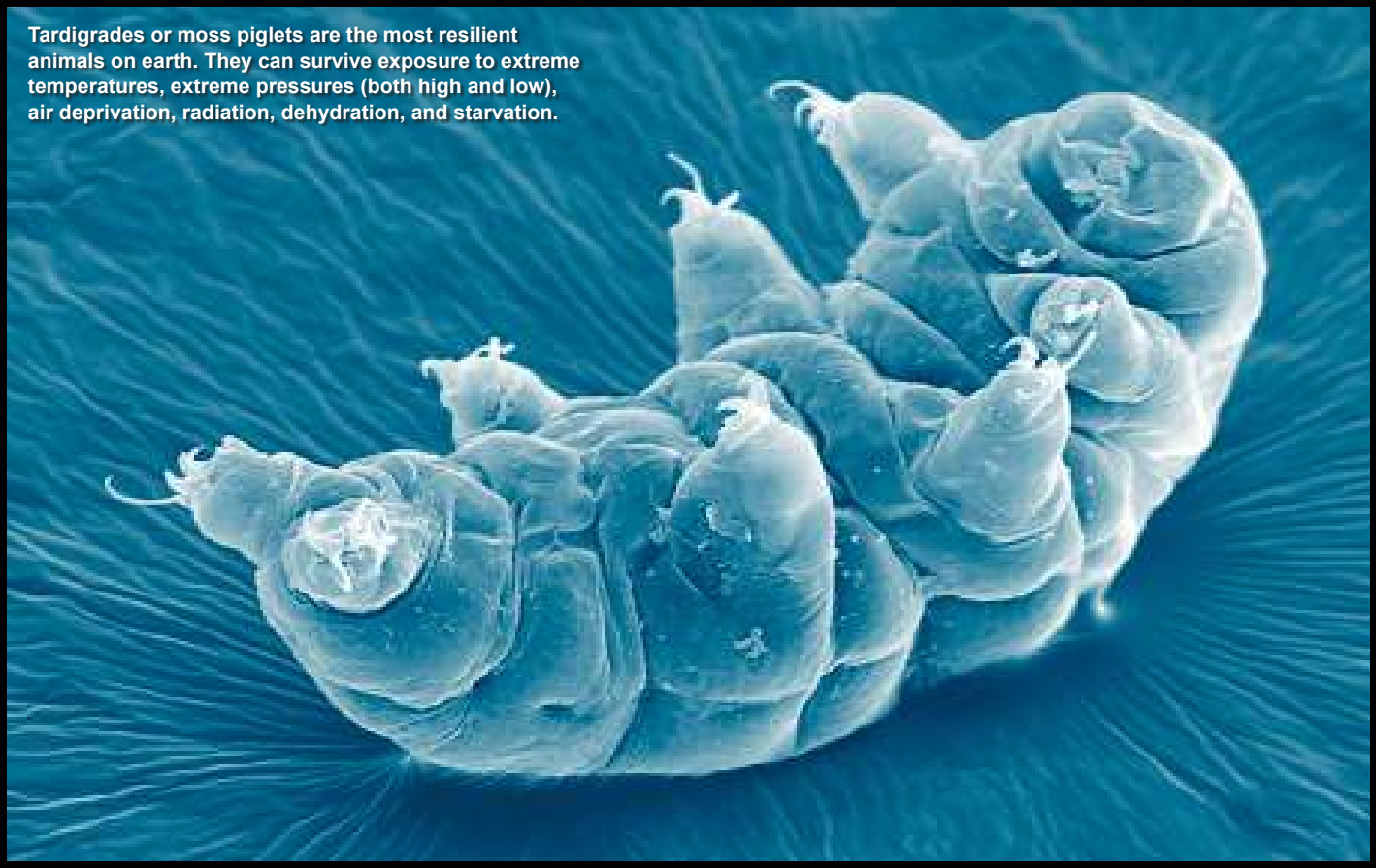
APURV DILIP JADHAV/SANCTUARY PHOTOLIBRARY

The forest ghost flower is a parasitic plant that grows on the dark, humid forest floor, feeding on plant roots.

DR. ANISH ANDHERIA

A gliding lizard extends its brightly-patterned patagium in flight, in the Peppara Wildlife Sanctuary in Kerala.

PRASANTHDAS D.S/SANCTUARY PHOTOLIBRARY



Tardigrades or moss piglets are the most resilient animals on earth. They can survive exposure to extreme temperatures, extreme pressures (both high and low), air deprivation, radiation, dehydration, and starvation.

PUBLIC DOMAIN/PAILLY

TEST YOUR ECO-SMARTS!

QUIZ TIME

HINT! CUB September 2023 holds the clue!

Did you learn some new facts in this issue? Try this quiz to see how much you remember!

Q1. Ambergris was once extracted from which of the following species?

☐ Honeybee ☐ Bottle-nose dolphin ☐ Sperm whale ☐ Walrus

Q2. Which of these species is considered extinct in India?

☐ Pink-headed Duck ☐ Great Indian Bustard ☐ Savanna Nightjar ☐ Great Heron

Q3. What were the first animals sent to space, in 1947?

☐ Monkeys ☐ Earthworms ☐ Fruit flies ☐ Humans

Q4. When species are preserved away from their natural habitat, it is called

☐ Cryogenesis ☐ Preservation ☐ *In-situ* conservation ☐ *Ex-situ* conservation

Q5. Charles Darwin, the Father of Modern Biology, sailed on which ship?

☐ *HMS Labrador* ☐ *HMS Beagle* ☐ *HMS Spaniel* ☐ *HMS Maine Coon*

1. Sperm whale 2. Pink-headed Duck 3. Fruit flies 4. *Ex-situ* conservation 5. *HMS Beagle*

Wild GUESS!

1. Green-eyed bee
2. Blue-banded bee
3. Hovering honeybee

The correct answer to last issue's **WILD GUESS** is **SUGAR MAPLE**. Email your answers to lakshmy@sanctuaryasia.com.

SHALINI JAI

PLANET CHEF

Choosing wisely what to put on your plate is a good way to help fight climate change! A whole-food, plant-based diet is better for your health, the planet and the animals! Here is an earth-friendly recipe that is easy as pie :-)

Homemade Peanut Butter

PUBLIC DOMAIN

PREP TIME: 40 min.

INGREDIENTS: 1 cup raw, shelled peanuts. 1 tablespoon oil, ½ teaspoon salt, 1 tablespoon honey or jaggery, 1.5 tablespoons cocoa powder (optional)

METHOD: Preheat an oven to 175°C. Place peanuts in a tray and bake for 20-25 minutes, or until done. Once cool, place the peanuts in a food processor and grind until creamy. It will take some time and you may have to stir occasionally to ensure it is ground evenly. Add salt, oil and sweetener of choice and grind again to combine. You can add cocoa powder to make chocolate peanut butter! Just add one tablespoon cocoa powder, and an extra spoon of oil and sweetener. You can try this with other nuts, such as almonds! Store in an airtight jar for a healthy snack. It can be added to salads too.

The GLOSSARY

A list of words and terms related to this issue's theme, SPACESHIP EARTH!

Overview Effect: The overview effect is a shift in one's way of thinking, which has been observed in astronauts who have journeyed to space and seen the Earth. These astronauts experience a state of overwhelmed awe and wonder at observing our planet from space.

Mutualism: Mutualism is a kind of relationship between different species, where both benefit from associating with each other. For example, Cattle Egrets feed on parasites on cows. The egrets get a quick meal, and the cattle get to stay bug-free!

Nucleosynthesis: The formation of elements. Nucleosynthesis occurred right after the Big Bang. It also occurs in the hearts of stars when they become supernovas.

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