



Topic	Team	A Special Issue on Co-existing Happily		Topic	Team
Animals	Socrates			Trees/ Plants	Atlas
Reptiles	Apollo			Birds	Rhea
Flowers	Nyx			Micro Organisms	Zeus
Insects	Midas			Sea Creatures	Poseidon

From the Editor's desk...

Pale Blue Dot is a photograph of planet Earth taken on February 14, 1990, by the Voyager 1 space probe from a record distance of about 6 billion kilometres (3.7 billion miles, 40.5 AU), as part of the Family Portrait series of images of the Solar System.

In the photograph, Earth's apparent size is less than a pixel; the planet appears as a tiny dot against the vastness of space, among bands of sunlight scattered by the camera's optics.

Voyager 1, which had completed its primary mission and was leaving the Solar System, was commanded by NASA to turn its camera around and take one last photograph of Earth across a great expanse of space, at the request of astronomer and author Carl Sagan.

Seen from about 6 billion kilometres, Earth appears as a tiny dot (the bluish-white speck approximately halfway down the brown band to the right) within the darkness of deep space.

I would like to present to you excerpts from Carl Sagan's book, *Pale Blue Dot*. Do not miss reading every word of this piece.

"Look again at that dot. That's here. That's home. That's us. On it everyone you love, everyone you know, everyone you ever heard of, every human being who ever was, lived out their lives. The aggregate of our joy and suffering, thousands of confident religions, ideologies, and economic doctrines, every hunter and forager, every hero and coward, every creator and destroyer of civilization, every king and peasant, every young couple in love, every mother and father, hopeful child, inventor and explorer, every teacher of morals, every corrupt politician, every "superstar," every "supreme leader," every saint and sinner in the history of our species lived there-on a mote of dust suspended in a sunbeam.

The Earth is a very small stage in a vast cosmic arena. Think of the rivers of blood spilled by all those generals and emperors so that, in glory and triumph, they could become the momentary masters of a fraction of a dot. Think of the endless cruelties visited by the inhabitants of one corner of this pixel on the scarcely distinguishable inhabitants of some other corner, how frequent their misunderstandings, how eager they are to kill one another, how fervent their hatreds.

Our posturing, our imagined self-importance, the delusion that we have some privileged position in the Universe, are challenged by this point of pale light. Our planet is a lonely speck in the great enveloping cosmic dark. In our obscurity, in all this vastness, there is no hint that help will come from elsewhere to save us from ourselves.

The Earth is the only world known so far to harbor life. There is nowhere else, at least in the near future, to which our species could migrate. Visit, yes. Settle, not yet. Like it or not, for the moment the Earth is where we make our stand.

It has been said that astronomy is a humbling and character-building experience. There is perhaps no better demonstration of the folly of human conceits than this distant image of our tiny world. To me, it underscores our responsibility to deal more kindly with one another, and to preserve and cherish the pale blue dot, the only home we've ever known."

- Carl Sagan, *Pale Blue Dot*, 1994

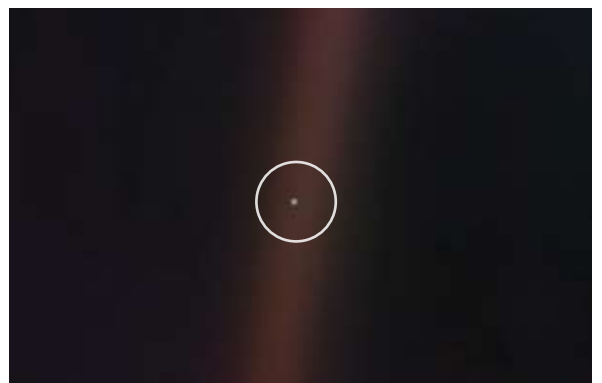
Let's not forget that in this *Pale Blue Dot*, we are a mere spec.

Let's live happily and also learn to respect other living beings on Earth. Let's all co-exist peacefully.

This edition of *Scribbles* is our humble dedication to all living beings in our home, Mother Earth.

Until the next issue

Lanada Jagan





Animals in Entertainment

- Let's stop this Abuse

Animals have long been used for the entertainment of humans – this is yet another example of man wielding his might; of lording it over all living beings. Animals are taken from their habitat, caged, ill-treated, beaten, and restrained from behaving in their own instinctive way.



1. **Zoos and aquariums isolate the animals.** Animals kept in zoos and aquariums are deprived not only of their natural habitats and climatic environments, they are made to suffer unnatural and cruel social deprivation; even isolation.
2. **Confinement is detrimental.** Animals in zoos and other confined areas cannot exercise, explore, play, forage and socialise in a way that they are meant to and they start to exhibit abnormal behaviour after a time. This demonstrates how such artificial, man-made environments are detrimental to an animal's physical and emotional wellbeing.
3. **Cages are not animal friendly.** Many zoos keep animals caged in the name of conservation. However the prime aim of all zoos is the display of animals. The cages are designed with the visitors in mind and not the animals.
4. **Circuses place unnatural demands.** Circuses make them perform confusing and bizarre tricks with the aid of whips, collars, muzzles, electric prods and more. Why does a tiger have to jump through hoops and why does a chimp have to wear a skirt and ride a bike!

5. **Animal racing traumatises them.** Other animal entertainments such as racing of dogs and horses also are cruel to animals – they prevent natural behaviours, cause the animal to become traumatised during 'training' and suffer untold agony all in the name of entertainment – a polite name for the gambling and betting that goes on at racing events.
6. **Animals in movies are mistreated too.** Even animals used for TV and film events are often badly mistreated and harmed – particularly when filming dangerous or stunt scenes.
7. **Dolphins are not comfortable in marine parks.** Imagine the plight of an intelligent, affectionate and wonderful animal such as a dolphin in a marine park – made to perform silly tricks for a few dead fish, this beautiful animal is kept in a small enclosure, away from his or her community, poked, prodded, and made to behave unnaturally each day.
8. **Animal sports inflict serious injuries.** The rodeo or calf roping events cause the animal to suffer broken bones, spurs and straps being dug into the skin, electrical rods, lassos that nearly break the neck, and more.
9. **Fishing and hunting are grossly cruel.** What else can be crueller than hooking a fish and pulling it out of water, the poor creature covered with blood all over? Imagine yourself being dragged out of air in a similar manner and maybe you'll be able to understand the plight to some extent! Just like fishing, hunting too causes painful death to animals. And many times, when the wounded animals escape being caught by the hunter, they are left to die of starvation, if not due to injury.
10. **Animal rides are not innocuous either.** Horse, elephant and camel rides are a common sight at many tourist spots and events. More often than not, these animals are not fed properly and are worn out. Their skin is often abraded due to ill-fitting equipment. They are goaded into carrying the rider even when they can hardly walk due to tiredness and sore foot.

L John Anand Antony, Production, Chemplast Sanmar, Karaikal.



Charismatic Wildlife

Wild animals and their habitats are clearly separable from the domestic animals and they live without human dependency. Animals, in general, are eukaryotic and heterotrophic organisms capable of moving their bodies, or at least body parts, by means of muscle or other contractile cells.

Eukaryotic:

Animal cells have their DNA contained in a nucleus bounded by a membrane separating it from the other cellular components.

Heterotrophic:

Animals cannot synthesise all their own nutrients but depend on consuming the bodies of other organisms to obtain the organic and other molecules they need for survival.

Wild animals have their own homes (forests), but due to problems of pollution and fear created by the humans they tend to lose their habitat and even their species. Humans kill animals and trade them for skin, tusk and much more. As a reciprocation, wild animals intrude into the human areas. Already the endangered species list is huge which alerts us to conserve wildlife. Wildlife conservation helps to protect the natural environment and endangered animals.



Conserving wildlife controls the ecosystem in a balanced way. Ecosystem is a chain to support all living things and non-living things for existence. Conserving wildlife economically supports the country. Human fascination with the beauty of wild animals drives tourism worldwide. This has the effect of boosting economy and creating jobs. Managed in the right way, tourism raises awareness of the need to conserve delicate ecosystems containing endangered animals.

D Manoj Kumar, Accounts, Chemplast Sanmar, Cuddalore.



• A lion in the wild makes no more than 20 kills a year.

- Deer have no gall bladders.
- Elephants can recognise themselves, something very few animals are known to do.
- Californian sea lions can hunt continuously for upto 30 hours.
- The only mammal capable of flight is the bat.



The Tamed Ones

Domestication is the process of adapting wild plants and animals for human use. Domestic species are raised for food, work, clothing, medicine, and many other uses.

Civilisations all over the ancient world domesticate animals for various reasons, depending on which animals were around them and what they could provide humans. Certain animals even took on religious significance in many civilisations.

Criteria for animal domestication

Why hasn't man domesticated every animal?

After all, a horse and zebra are pretty similar, but you will not see many people trying to ride a zebra. Animals must meet some criteria like flexible diet, reasonably fast growth rate, ability



to breed in captivity, pleasant disposition and temperament that makes it unlikely to panic in order to domesticate it.

Importance of animal domestication

Domestic animals release people from the hard labour, make possible the transport of natural resources, provide fat and protein for improved nutrition, animal milk for dairy needs, provide leather and wool for clothing and shelter, dried manure for fuel. They were the sole source of agriculture till machinery equipment arrived.

Some animals domesticated for a purpose no longer serve that purpose. Humans themselves have changed significantly as a result of animal domestication. In today's world, we take animal domestication for granted. Living beings depend on one another for many reasons. Since we humans are the most superior beings due to our intelligence, we seem to dominate every other being on earth and exploit them.

K Rajasekar, Technical Services, Chemplast Sanmar, Cuddalore.



Crocodile - The world's largest living reptile

Crocodiles, the world's largest living reptiles, relish privacy and warm weather, and thrive in still or slow waters that provide plenty of camouflage (cover up).

More than 200 million years ago, crocodiles roamed the Earth among the dinosaurs. Today's crocodile began evolving 80 million years ago, developing the traits that have enabled its survival. Cold-blooded, they flourish in tropical habitats where they can bask (stretch out) in the sun year-round. Adult crocodiles live to around 50 to 60 years; however, some have lived as long as 130 years.

Historically, crocodiles were valued and hunted for their skin and meat. Today, destruction of the crocodiles' natural habitat for human use is one of the biggest threats to the survival of the species.

Relationship with humans

The larger species of crocodiles are very dangerous to humans, mainly because of their ability to strike before the person can react. The Salt water crocodile and Nile crocodile are the most dangerous, killing hundreds of people each year in parts of Southeast Asia and Africa.

Crocodiles are protected in many parts of the world, but they also are farmed commercially. Their hides are tanned and used to make leather goods such as wallets, briefcases, purses, handbags, belts, hats, and shoes.

In religion

Crocodiles have appeared in various forms in religions across the world. Ancient Egypt had Sobek, the crocodile headed God and Taweret, the Goddess of childbirth and fertility, with the back and tail of a crocodile.

Crocodiles appear in different forms in Hinduism. Varuna, a Vedic and Hindu God, rides a part-crocodile and his consort Varuni rides a crocodile. Similarly, the Goddess personifications of the Ganga and Yamuna rivers are often depicted as riding crocodiles.

P Prabakaran, *Production, SSCL, Berigai.*



Lizards - Can also be edible?!

God created every living creature from water. Some of them walk on their bellies, some walk on two legs, and some walk on four. This universe clearly belongs to all of God's creatures. Reptiles have as much right to live in this world, as human beings. In totality, the entire earth is a common property of all of us. Any life should be valued. Reptiles cannot speak for themselves and for that reason, we need to protect them. Protecting them is our responsibility.

Reptiles are from a class of animals. Snakes, lizards, turtles, crocodiles and tuatara lizard are members of the reptile family which has about 2500 species of lizards, 250 different kinds of turtles, and about 22 different crocodiles.

Lizards are very important species in reptiles. The largest lizard is the Komodo monitor. It can grow longer than a person. The smallest lizard is a tiny gecko. Lizards have a lifespan of around 5-40 years depending on the species.

Some lizards are useful for medicinal applications. For example,

Gila monster produces toxins which reduce plasma glucose. The substance is now synthesised for use as an anti-diabetes drug. Another toxin



from Gila monster's saliva has been studied for use as an anti-Alzheimer's drug.

A news that published in Daily Mail UK reported that the oldest man on earth who lives in Bolivia has passed his 123 years and survived because he regularly eats lizard meat. This man is still alive today and has 16 grandchildren and 39 great-grand-children. He is still strong enough to walk a few kilometres everyday. Isn't it amazing?

Poluboyina Prasad, *Research & Development, SSCL, Berigai.*



Winner of the **Spot the World Heritage Sites in India** contest (announced in Scribbles July-August 2017)

Sheraya Lakhera d/o Neerav Lakhera
BSc&B Safety Systems (India), Vadodara.

Flickering fork-tongued neighbour

Snakes make up a significant proportion of the middle-order predators that keep our natural ecosystems working. Without them, the numbers of prey species will increase to unnatural levels and the predators that eat snakes will struggle to find food. The feeding habits of snakes act as a natural form of pest control. They serve as a food source for larger predators such as hawks, owls, herons, and carnivorous mammals such as bobcats.



The dark side of the snake human relationship; an estimated 20,000 human deaths occur each year from snakebites, mostly in sub-Saharan Africa and Asia, though

with the unreported incidents the total may be as high as 94,000. On the brighter side, the cyto-toxic effect of snake venom is being researched as a potential treatment for cancers.

They are one of the oldest and most widespread mythological symbols. The symbolic values assigned to snakes are fertility and rebirth, guardianship, poison, medicine and vindictiveness. Snakes are a part of Hindu worship, as Lord Shiva is depicted in most pictures with a snake around his neck. In ancient Greece, they were seen as healers. In Christianity and Judaism, the snake makes its infamous appearance as the Satan tempting Adam and Eve to eat the forbidden fruit and later returns in Exodus with Moses, as a sign of God's power, in the form of a bronze snake on a pole that, when looked at, cured the people of bites from the snakes and plague.

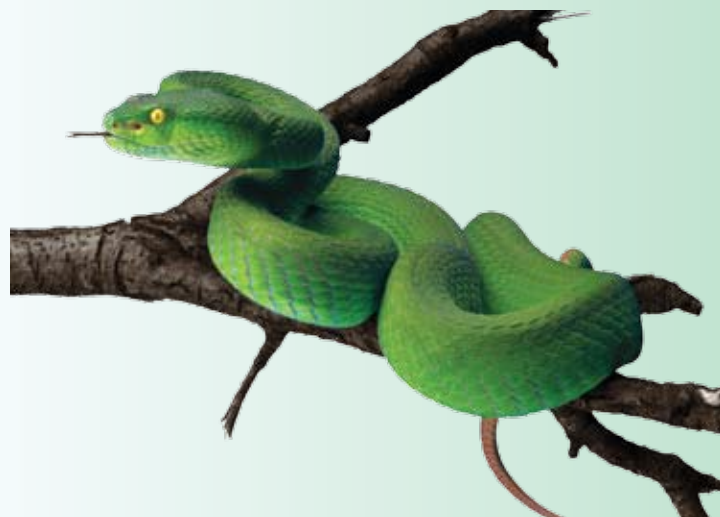
To humans, snakes inspire fascination and feelings in a way that no other type of animal can. They are food to a certain population and God to some. We need to co-exist with these staring eyes that never blink or close creatures as they, like any other living being, play a vital role in maintaining the balance in Nature.

Catherine Jovita Durairajan,
Human Resources, Corporate, Head Office.



- *The most dangerous snake in the world is the saw-scaled viper, which bites and kills more people each year than any other snake.*
- *Snakes live on everywhere on Earth except Ireland, Iceland, New Zealand, and the North and South Poles.*
- *Of the approximately 725 species of venomous snakes worldwide, 250 can kill a human with one bite.*
- *Some animals, such as the Mongoose, are immune to snake venom.*
- *The Brahminy Blind Snake, or flowerpot snake, is the only snake species made up of solely females and as such, does not need a mate to reproduce. It is also the most widespread terrestrial snake in the world.*
- *While snakes do not have external ears or eardrums, their skin, muscles and bones carry sound vibrations to their inner ears.*
- *Some snakes have over 200 teeth. The teeth aren't used for chewing but they point backward to prevent prey from escaping the snake's throat.*
- *Snakes typically need to eat only 6 - 30 meals each year to be healthy.*

- *Sea snakes with their paddle-shaped tails can dive over 300 feet into the ocean.*
- *The king cobra is thought to be one of the most intelligent of all snakes. Additionally, unlike most snakes, who do not care for their young, king cobras are careful parents who defend and protect their eggs from enemies.*
- *The venom from a Brazilian pit viper is used in a drug to treat high blood pressure.*

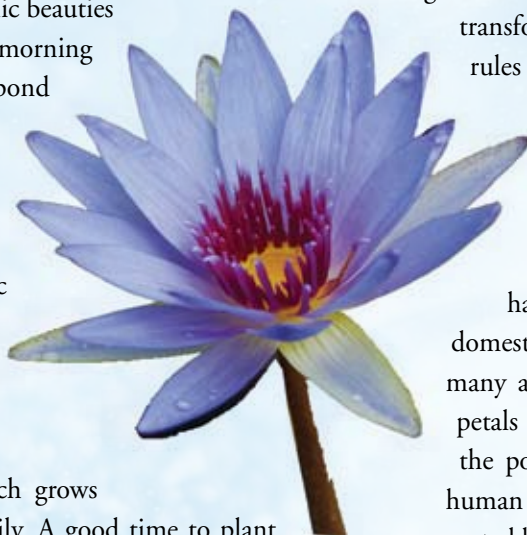




Lily of the Valley

Perhaps one of the greatest scenic beauties that you may witness on your morning walk through the sides of the pond on a summer daybreak is the blooming of the blue water lily (Alli-Tamarai). Attractive in colour, it grows from 2 to 6 feet in height and stands majestic with its petal beautifully unfolded in bright sunshine. The blue water lily is the national flower of Sri Lanka.

It's a marsh loving plant which grows from the bulb of a preserved lily. A good time to plant it may be in spring or autumn. Being a perennial plant, it lives for 2 years and most bulbs bloom only once a year. Lilies



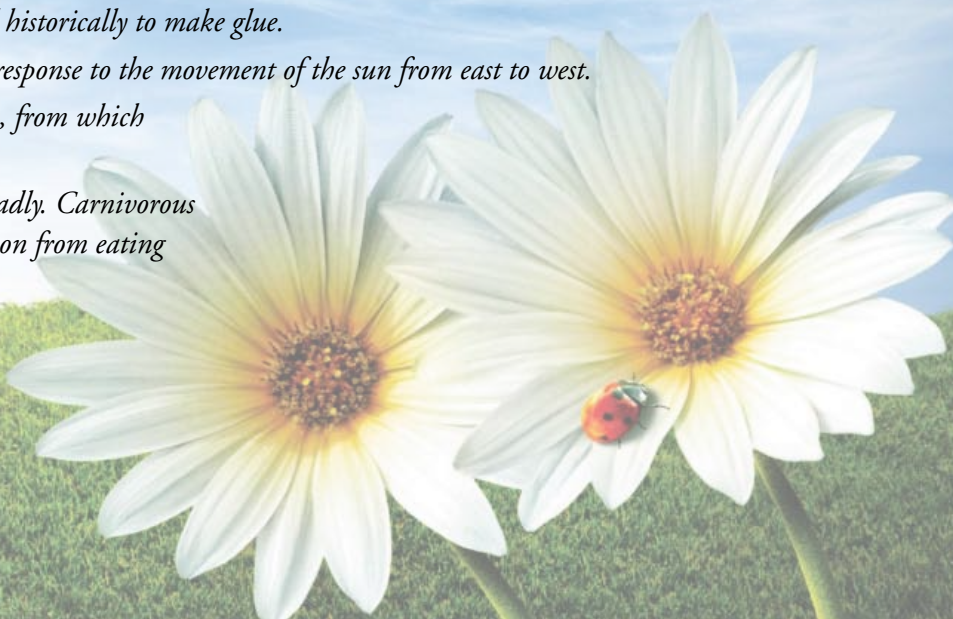
hate winter and remain dormant during the hazy seasons. It is considered holy by the Buddhists being one of the 108 auspicious signs. It is an important and well-known medicinal plant, widely used in the Ayurveda and Siddha systems of medicines for the treatment of diabetes, inflammation, liver disorders, urinary disorders, menorrhagia, blenorrhagia, menstruation problem, as an aphrodisiac and as a bitter tonic.

In today's modern world, the self-centred man has forgotten the needs of other species in the world. He has transformed into a dictator where his own pleasure rules the existence of other species. With the climate change worldwide, raining pattern has been disturbed and industrial wastes are dumped into the pond hence the life of lilies is at stake. No longer can we see a lily in a wild pond as our ancestors did. We have ended up watching it in a park where it's domesticated. The pollen of a lily is consumed by many animals. Lilies cover up the pond with their petals and prevent the evaporation of water from the pond. Hence a natural protector of the basic human life element without the need of polystyrene as suggested by the Tamil Nadu Government.

U Pradeep, Planning, Sanmar Foundries, Viralmalai.



- Roses are related to apples, raspberries, cherries, peaches, plums, nectarines, pears and almonds.
- Tulip bulbs were more valuable than gold in Holland in the 1600s.
- Ancient civilisations burned aster leaves to ward off evil spirits.
- The very expensive spice, saffron, comes from a type of crocus flower.
- The largest flower in the world is the titan arums, which produce flowers 10 feet high and 3 feet wide.
- The lotus was considered a sacred flower by ancient Egyptians and was used in burial rituals.
- The juice from bluebell flowers was used historically to make glue.
- Sunflowers move throughout the day in response to the movement of the sun from east to west.
- Flowering nicotiana is related to tobacco, from which cigarettes are made.
- Flowers may look sweet, but some are deadly. Carnivorous plants like the Venus Fly Trap get nutrition from eating insects.



Gorgeous Blooms at Home

“ The flowers that grow to glad all earth
Are emblems of a better birth,
When we shall wake beyond the skies,
And see the plains of heaven arise.
The trees that bud and blossom forth,
Throughout the world from south to north,
Are tokens that a life will bloom
When manhood’s passed beyond the tomb”

Hibiscus (Sembaruthi Poo)

Hibiscus is a species of annual and perennial flowering plants. Dried hibiscus flowers can be used to make a herbal tea that is a mild diuretic and can lower blood pressure.

Care Tips

Hardwood cuttings grow well in a sheltered position in full sun. Potted Hibiscus should stand outside during summer and be moved indoors during winter. When indoors, they require regular misting, and frequent pruning will help shape the plant as well as encourage flowers.



Did you know?

Different Hibiscus species are the national flowers of South Korea and Malaysia and the state flower of Hawaii and Puerto Rico. A red Hibiscus represents the Hindu goddess Kali. In Polynesia, dried fibres from Hibiscus bark are used to make grass skirts and wigs.

Jasmine (Malligai Poo)

Jasmine is a sweet smelling plant that is renowned for its ornamental beauty and distinctive fragrance. Jasmine is also used frequently in making tea, syrup and essential oils.

Care Tips

Jasmine likes cool conditions with plenty of light and air. During the summer months, Jasmine should be watered often and fed with a plant fertiliser every couple of weeks. If you want your Jasmine to flower in summer then care in



the winter is important and it should be kept below 10°C and watered sparingly.

Did you know?

The buds of the Jasmine plant have a stronger smell than the flowers of the plant. In some people this strong smelling scent can lead to migraines and headaches. When the sun sets, the scent of the Jasmine plant is strongest and is incredibly sweet.

Dahlia (Alli Poo)

The Dahlia is a daisy-like flower that now has many hybrids around the world. Dahlias were first recorded by Westerners in 1615, when they were called by their Mexican name, acocli.



Care Tips

Dahlias don’t require lot of attention but they do need a lot of watering. They need consistently moist soil and an abundance of sunlight. It is recommended that they are planted around eight inches apart.

Did you know?

Penzance in Cornwall is the home of the National Collection of Dahlias in the UK. The public can see more than 10,000 dahlias in bloom for a few days in September every year.

M Bharathidhasan, Customer Support,
Sanmar Foundries, Viralmalai.

Lotus - Beautiful, Medicinal and Edible

We value beauty for its own sake, yet many colourful flowers have much to offer beyond their good looks. Some can be used medicinally, others are good to eat, and many provide food and habitat for insects. Some flowers are threatened by habitat destruction just like birds and animals. Give multipurpose flowers a bit of space in your garden and prepare to be amazed at what medicinal flowers can do for your health, your palate and your spirits.

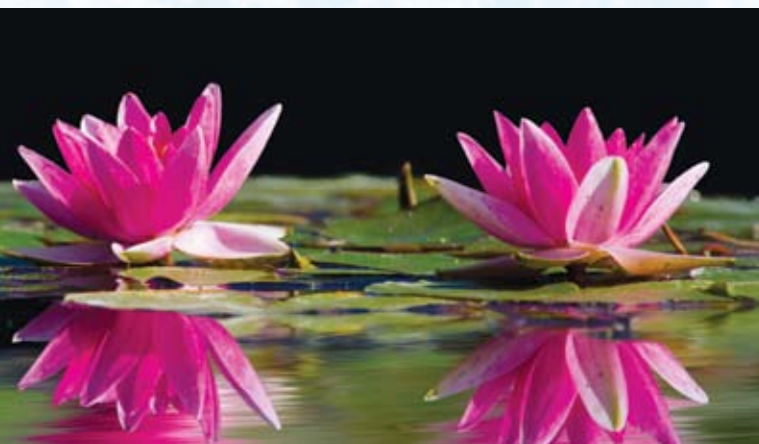
The Lotus, the national flower of India, is a symbol of supreme reality. To the Indian psyche, the lotus is more than a flower – it represents both beauty and non-attachment. There is a saying that although it grows in mud, it smells of myrrh. Toru Dutt, in her sonnet 'The Lotus', addresses the flower as the "queenliest flower that blows."

Medicinal Properties

All parts of the lotus can be consumed which including its petals, flowers, flower stamens, seeds, and stems.

Leaves

The rhizomes or leaves are used with other herbs to treat sunstroke, fever, diarrhoea, dysentery, dizziness, vomiting of blood, and haemorrhoids. The whole plant is used as an antidote to mushroom poisoning.



Seeds

The embryonic seeds for high fever, cholera (Chinese), nervous disorders and insomnia; the seeds to stop vomiting, relieve indigestion and diarrhoea or just as a tonic.

Flowers

Pounded petals for syphilis; for cosmetic unguents (Java); the flower stalk with other herbs to treat bleeding from the uterus.

Fruit

The pods contain alkaloids that stop bleeding.

Stamen

Lotus stamen is sweet, astringent, and neutral, benefiting the heart and kidney; it is mainly used for preventing discharge, such as treatment of leucorrhoea or for frequent urination.

Significance of Lotus in Philosophy

Although, lotus is an archetype of beauty, it symbolises non-attachment. In his essay "The Secret of Work", Swami Vivekananda opines, "Just as water cannot wet the lotus leaf, so work cannot bind the unselfish man by giving rise to attachment to results." Even though the lotus is rooted in mud, it continues to float on the water without becoming wet or muddy.

Healthy treats to our taste buds

In South Indian states, the lotus stem is sliced, marinated with salt to dry, and the dried slices are fried and used as a side dish. In Kerala and Tamil Nadu, this end product is called 'Thamarai Vathal'.

The stamen and seeds are used in making fragrant tea and herbal tea recipes in Korean and Chinese cuisines. Research suggests that the remedies with lotus are particularly effective in tea form as tea is digested much faster.

V Balaji, Development, Sanmar Foundries, Viralimalai.



Agave's single blossom

The agave plant is often called 'the century plant'. That's because it can flourish for years without growing any flowers. Then, at the end of its life, an agave plant produces a single flower and dies.

Moon flowers' odd blooms

Speaking of odd blooming patterns, moon flowers are another decidedly unique plant. While many flowers need at least a little sunshine to thrive, moon flowers bloom at night in the light of the moon.





Ant - Lessons we can learn

“Courage isn’t always a lion’s roar, it’s also the silence of an ant working patiently, persistently and never giving up”. This sentence describing courage is also a very good description of the nature of ants. Ants, which are often ignored and considered weak when compared to humans, are indeed amazing. However, humans, in their ignorance and pride, underestimate them. Did you know that ants can lift as much as 50 times their weight? A second grade student of similar strength would have picked up a car!

Moreover, it would surprise many to know that ants have the same bio-mass as humans! Ants live in colonies. They are social insects of the environment. There are three types of ants in a colony- the queen, the male ants and the female ants. The male and queen ants have wings while female ants do not. The queen of the colony is very important. So important, that if she dies, the colony can survive no more than a few months. Leaving strength aside, ants also possess intelligence. They had started farming 50 million years before humans did. They also have assigned posts like security guards who defend the queen and ants which attack other colonies and take the eggs which would be enslaved by them on hatching.

Contrary to what it may seem, ants communicate not only through chemicals and touch, but also by sound! Talk about variety and humans don’t stand a chance when compared to ants. Ants have more than 12,000 species all over the world. They possess global super colonies. Talk about numbers — for every human you see on earth, there are over a million ants. We should actually be happy that they don’t know that.

Talk about human qualities — there are loads of things we can learn from them like the following:

Being organised

Every ant in the colony has a set of assigned tasks, from laying eggs, building nest to gathering food.

Unconditional sharing

They share everything they collect. They never eat alone.

Well-disciplined

Ants always march one after the other without chaos, disorder and confusion.

Co-operation and co-ordination

Ants are able to achieve success because of their unselfish nature and team work. It is clearly visible by the fact that ants’ colony management is running successfully without a leader to lead!

Decision-maker

Even without a leader, each ant knows what to do and how to do. They make their own timely decisions and accomplish their tasks.

Good planner

As you know from the famous poem of the ant and the grasshopper, ants definitely are smart to store their food in summer for use in winter.

Having known all these amazing and mystical qualities of ants, we should aspire to learn from them. These awe-inspiring creatures deserve our respect for these qualities and for their feeding on insect eggs, resulting in pest control.

Anandpratap Rajkaran Singh, Flowserve Sanmar, Karapakkam.



Grasshopper - Miniature Marvels

The Earth is unique in its own way and its rich bio-diversity adds another feather to its crown. There are innumerable species existing in the earth's ambience and a large fraction consists of insects - small and large, beautiful and amazing! Grasshopper is one of the unique insects in the Caelifera family. Its size ranges from medium to large and it lives in the close vicinity of grass, as suggested by the name itself. It is famous for its ability of jumping upto a reasonable height or hopping capacity.

There are more than 11,000 known species on earth. They have an extreme migratory capacity as they can travel over long distances in cold seasons. Unlike other insects in the mentioned family, the grasshopper is known for its remarkably long antennae and it is often longer than the grasshopper's body. They use their long antennae in order to sense their surroundings. Grasshoppers have six joint legs by virtue of which they are able to jump to an extraordinary distance. Despite being large insects, grasshoppers are herbivores and have a diet that consists solely of plant matter. Grasshoppers consume grasses, weeds, leaves, shrubs, bark and numerous other parts of plants that surround them. In late autumn or early winter, female grasshoppers lay an average of eight egg

Pods usually in an unbroken sod or sometimes into the soil, a couple of inches underground. An egg takes almost nine months to hatch after which the baby grasshoppers are able to interact with the outer world.

Sumanta Laha, *Flowserve Sanmar, Karapakkam.*



Silkworm

A silkworm is a caterpillar that produces silk which is used to make thread or cloth. They are the larva of the moth native to Asia that spins a cocoon of fine, strong, lustrous fibre that is the source of the commercial silk. The various species raised today are distinguished by the quality of silk they produce. Silkworms generally feed on the Mulberry leaves and oranges.

The moth (*Bombyx Mori*) will not bite making it an ideal worm for feeding most reptiles, amphibians and more animals.

Silkworms now depend on silk producers, laboratories and school children to propagate the species. In their domestication, the moths lost the ability to fly, so wild population no longer exists. Also contributing to their extinction is the extraordinary fact that they only eat mulberry leaves.

Silk production is officially called Sericulture.



In the production of silk, manufacturers use silkworms' cocoons to produce silk. It consists of a single thread of silk that stretches to a length of 1000 to 3000 ft when unravelled. A pound of raw silk requires the use of 2000 to 3000 cocoons and the silk manufacturers of the world produce around 70 million pounds of raw silk each year. Members of some cultures eat the silkworm pupae. Koreans create a snack food out of the pupae by boiling them in water and then seasoning them. This food is called beondegi. The Chinese use the dried bodies of silkworms to produce a medicine intended to relieve flatulence and bodily cramps.

A silkworm a day may not keep the doctor away, but for some in South Korea, the silkworm proteins are the pathway towards less diabetes, less fatigue and stronger muscles.

R Rajevan, *Sales, BS&B Safety Systems (India), Chennai.*



The Ladybug

Ladybugs aren't really bugs at all, they're beetles! Over its lifetime, a ladybug may consume as many as 5000 aphids.

The name 'ladybug' was coined by European farmers who prayed to the Virgin Mary when pests began eating their crops. After ladybugs came and wiped out the invading insects, the farmers named them 'Beetle of Our Lady'. This eventually was shortened to lady beetle and ladybug. NASA even sent a few ladybugs into space with aphids to see how aphids would escape in zero gravity.

Thousands of ladybugs may gather in the same location, taking advantage of the collective warmth of a colony. Asian multicoloured ladybugs, an invasive species in North America, have earned a reputation as a home invader. These beetles tend to move indoors for winter, where they can become a nuisance in people's houses. Convergent ladybugs gather in the mountains in such numbers that collectors can scoop them up by the bucket.

Ladybugs practice cannibalism

If food is scarce, ladybugs will do what they must to survive, even if it means eating each other. A hungry ladybug will make a meal of any soft-bodied sibling it encounters.



The most familiar species is the seven-spotted ladybug, with its shiny, red-and-black body. In many cultures, ladybugs are considered good luck.

Most people like them because they are pretty, graceful, and harmless to humans. But farmers love them because they eat aphids and other plant-eating pests.

Ladybugs are colourful for a reason. Their markings tell predators: "Eat something else! I taste terrible." Birds are ladybugs' main predators, but they also fall victim to frogs, wasps, spiders and dragonflies.

The Honeybee

Honeybees live in colonies with one queen running the whole hive. Worker honeybees are all females and are the only bees most people ever see flying around outside of the hive. They forage for food, build the honeycombs, and protect the hive. Many species still occur in the wild, but honeybees are disappearing from hives due to colony collapse disorder. Scientists are not sure what is causing this collapse.



Queens regulate the hive's activities by producing chemicals that guide the behaviour of the other bees. Male bees are called drones the third class of honeybee. Several hundred drones live in each hive during the spring and summer, but they are expelled for the winter months when the hive goes into a lean survival mode.

Worldwide, there are around 25,000 different species of bees. All these species dutifully serve as pollinators of our agricultural world. And they are all excellent at what they do. For example, all bees have stiff hairs and pockets on their legs, allowing them to collect more pollen and be more efficient transporters of it between plants. Bumblebees appear to be even more successful at pollinating certain crops due to their larger sizes and more vigorous vibrations. This helps to better disperse pollen amongst the flowers and fruits it visits.

G Sanjay Kumar

Training, Chemplast Sanmar, Karapakkam.



The golden orb-web spider spins the largest of all orb weaver spider webs, and is believed to make the strongest silk.

Hercules beetles can lift 850 times their own weight. That's equivalent to a human lifting 10 elephants.



The enchanting butterfly

Through the ages, butterflies have captivated our imagination and delighted our senses with their beauty. When you see a butterfly, you just stop for a moment and wonder about its beauty. The name butterfly came from its pale yellow colour; people in early centuries believed that these flying creatures are real fairies that stole butter and flew. None would have crossed their childhood without chasing a butterfly or getting fascinated by it.

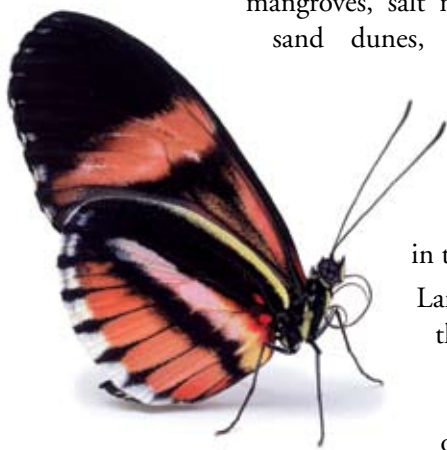
Butterflies live in different habitats, including mangroves, salt marshes, lowland forests, sand dunes, wetlands, mountainous regions and grasslands.

Rocky areas and bare ground give larvae a place to find adequate food and adults to lounge in the sun.

Larger butterflies live longer than the smaller ones. The average life span of a butterfly is usually about one month. Although the smallest butterflies that

you can usually spot feasting on the flowers in your front yard live about one week.

Without these wonderful insects, many plant species would then be unable to reproduce and their populations would dramatically decrease. First day of November in Mexico is celebrated as 'The day of dead' which marks the arrival of millions of Monarch butterflies from north Canada all the way along America. People go to cemeteries on that day, celebrate and communicate with their departed



ones considering these butterflies as their ancestors. These monarch butterflies use sun and wind as a compass and successfully survive their journey living 10 times more the usual life span.

Human impact

A few centuries ago, when the human population on Earth was smaller and less affluent, mankind required less land and consumed far less of the planet's resources. Enough wild habitat existed to ensure that butterflies could move easily between their breeding sites. Since then the human population has grown and has become increasingly wasteful and greedy. Wild places have consequently diminished in size and become increasingly fragmented and isolated.

Habitat destruction across the world is caused almost entirely by human activity. Urban expansion has the greatest impact, but governmental policy on farming, forestry and road planning also has a very profound effect on the distribution and abundance of butterflies.

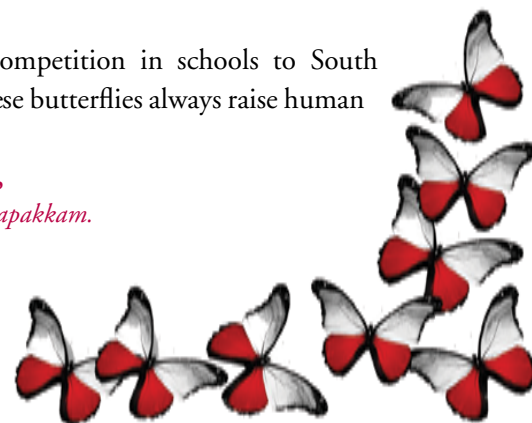
Following are some of the ways to save butterflies:

- Help save grasslands
- Don't use pesticides
- Do your part to combat climate change
- Educate yourself

From fancy dress competition in schools to South American rituals, these butterflies always raise human spirits.

Yashkumar Makvana,
Flowserve Sanmar, Karapakkam.

C Chennakesavan,
*Customer Support,
BS&B Safety
Systems (India) Ltd.,
Karapakkam.*



Interesting facts about Butterflies and Wasps

- Vespa scooters are named after wasps - vespa means 'wasp' in Italian.
- Wasps may sting if people come close to them.
- Wasps RFC is an English Professional Rugby Union team originally based in London. The name dates back to 1867, a time when names of insects were fashionable.



- In Amazon, butterflies drink the tears of turtles to get necessary sodium in their diet.
- Agricultural industry now regularly deploys wasps to protect crops.
- The butterflies eat harmful insects. A few act as a predator of ants while others live as mutualists in association with ants.
- Butterflies are an extremely important group of "Model" organisms used for centuries to investigate many areas of biological reason fields such as navigation, genetics etc.

M Sriram, K C Gopalakrishnan
ERP, Chemplast Sanmar, Karapakkam.



National Flowers from



around the World



Guess Who?! Clue No. 7: On coming back, he began to develop a revolutionary theory about the origin of living beings that was contrary to the popular view of other naturalists at that time.



Trees - Adding value to Life

God's creatures should co-exist in this world for many reasons. I always get excited about the trees in my township. Houses flocked with trees of mango and jack fruit that form a canopy. It resembles an orchard. Our day starts enthusiastically with the chirping of birds supported by the cuckoo's cuckoo and ends in a pleasant mood when we return.

It is nostalgic for me to think about my childhood days in my native hamlet in the early 80s. It is about the trees at both sides of the road that welcome you when you enter and wave goodbye when you leave. They shelter a plethora of birds that settle down at the end of the day and flutter to leave for their survival in the morning. People take rest in the dense shadow the trees offer, even village meetings were held and children used to swing with the roots. Surprisingly all those trees in juxtaposition belong to one particular category, "The Banyan Tree".

Banyan tree is our national tree. It is one of the most magical trees – not only in the way its aerial roots create an astounding structure, but also in the properties that each part of the tree holds in every single aspect.

Life Span

- 500 to 1000 years or more.
- Difficult to determine because the trunk is hidden by years of aerial root growth.

Indian Culture

- It is sacred as its leaves are considered to be the resting place of Lord Krishna.
- It is also believed that Buddha achieved enlightenment under this tree.
- Banyans are the world's biggest trees in terms of the area they cover.

Uses

From medicinal to recreational, there's no part of life in which this tree doesn't help. It also caters us in many forms like ropes, natural biodegradable food plates, adhesives, firewood etc.

Trees contribute to environment by providing oxygen, improving air quality, climate amelioration, conserving water, preserving soil, supporting wildlife, reducing the amount of carbon dioxide in the air and giving off oxygen just what we need to survive!

In return what have we done to this splendid living thing? What can we do to save the Earth's life-support system?

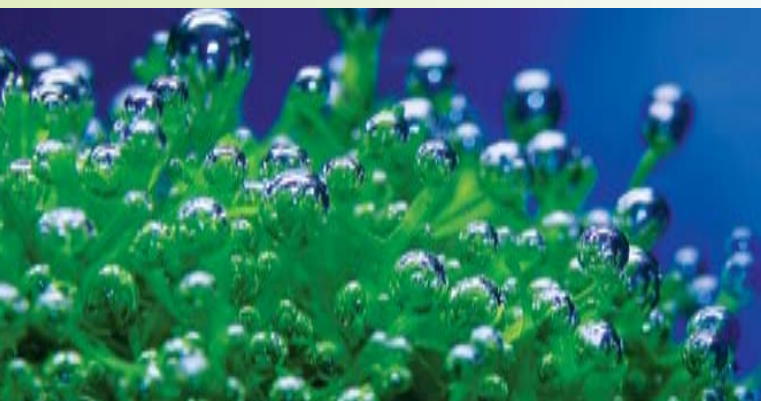
Humans are programmed to die, but trees are potentially immortal. We are part of a truly civilised society; often talk about human rights, so should there be 'Nature's Rights'? Yes, we should cultivate the mindset to protect nature's rights.

S Thangavel, *Instrumentation, Cabot Sanmar, Mettur.*



Aquatic Plants - Balancing eco-systems

Aquatic plants aren't just used in the water garden to provide beauty - they also serve the very important function of balancing the pond ecosystem. Their valuable biological filtration helps remove nitrogen, ammonia, nitrate, and other minerals.



Water plants absorb nutrients and reduce light levels in the water, which could otherwise promote the growth of algae, which causes green pond water.

In addition, the plants provide food, shade, and protection for the fish and wildlife that live in and around the pond. Typically, they are divided into four groups - water lilies, marginals, floating plants and submerged plants.

Aquatic plants provide many ecological benefits and are essential in promoting the diversity and function of aquatic systems.

Risks

Globally, there are aquatic plant problems in every country. Most aquatic plant problems are regional, but some plant species have caused significant agricultural, economic, and human health impacts worldwide. A description of those species that have routinely been named in literature as causing serious global problems for agriculture, aquaculture, natural areas, people and economic security can be found in the Global Invasive Species Database, and are listed by the International Union for Conservation of Nature (IUCN) and Invasive Species Specialist Group (ISSG).

J Ramasamy, Production, Chemplast Sanmar, Mettur.

Desert Plant - Tough and Sturdy

A desert is generally referred to as Biome, since it supports a number of plants with numerous population. The amount of rainfall in the desert is low and very few plants grow and survive. Desert plants have three types of adaptations - annual, succulent and shrubs.



Many desert plants have spines for defence and conservation of water. The cacti and succulent trees are highly adaptive for collecting and conserving the water for its survival. In the desert, one of the important flora is *Citrullus colocynthis*, which is also known as thumba. It is a well-known sand dune stabilizer. The roots are large and perennial, which leads to high survival rate in the desert. The flowers are yellow in colour and the fruit seems like water melon with a bitter taste, also known as bitter apple. The fruit can be eaten for its medicinal properties. The main application of the plant is the use of its seeds. Oil can be collected extensively from the seeds, which is enriched with fat and protein. The oil stimulates hair growth, controls diabetes, serves as an energy

source and used for soap production. There are lots of strains on such plants, threatening their survival.

The desert is a warehouse of many economic products. Many desert plants have biotic interference.

Development activities, infrastructure, oil gas production, military operation, missiles testing and climate changes due to global warming, have destroyed many flora in the desert.

D Ragu Ramachandran, Stores, Chemplast Sanmar, Mettur.

Guess What? Where?



Khajuraho, Madhya Pradesh

Congratulations to our first correct respondent:

R Raja, IAP II, Panruti.



The Adventurous Aquatic

The Penguins are flightless aquatic birds which are popular around the world for their unusual look and they are from the family of Spheniscidae. The name is believed to be originated from the Welsh term 'pen gwyn'.

The penguin's body is adapted for swimming. Its body is fusiform (tapered at both ends) and stream lined. They have a large head, short neck, and elongated body. The tail is short and wedge shaped. The legs & webbed feet are set far back on the body,

which gives their upright posture. Their bones are denser than those of flying birds; this allows them to float and plunge at moderate depths at will. Most of them can swim at 8–9 km/h or 2 m/s. The penguins do not have teeth. Instead their tongue and throat have spiny structures that prevent food from slipping out. Each penguin has a unique voice, and that is how they recognise each other. Penguins can drink salt water because they have special glands that drain the liquid out of the nose and expel the salt.

Penguins spend a lot of time in the water, but they also depend on the land to settle their colonies. Besides cold water, blocks of ice, tropical beaches, and rocky coasts are some of the habitats where they dwell.

Survival is a major concern for penguins. They make sure that their home lacks predators. Penguins are also harmed by the environment. One cause is the rising ocean temperatures and increasingly erratic climate patterns. In addition, oil pollution from drilling and shipping industries impacts penguin population. The rapid change of penguin population is a clear serious warning that we are managing oceans poorly which could potentially lead to catastrophic consequences.

B Prashanth, Planning, Pentair Sanmar, Viralimalai.



Famous birds in literature include the Albatross in The Rime of the Ancient Mariner, Archimedes in The Once and Future King, Chicken Little, Chanticleer in Chaucer's Nun's Priest's Tale, Fawkes and Hedwig in Harry Potter, Mother Goose, the Raven in Edgar Allen Poe's "The Raven", Owl in Winnie the Pooh, Thorondor (the king of eagles) in J.R.R. Tolkien's Lord of the Rings, and The Ugly Duckling.

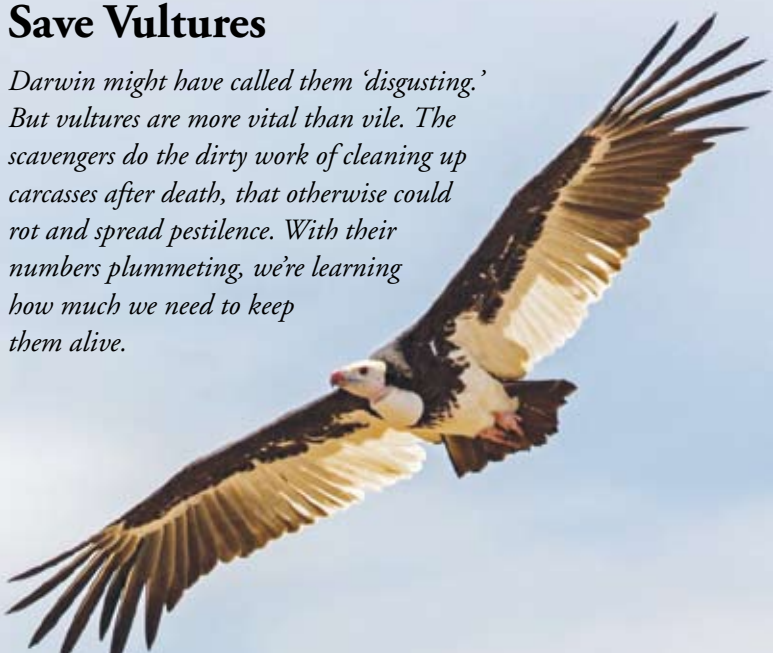


1. Ravens are great at mimicking human speech and sounds.
2. Ostriches have the largest eyes of any land animal.
3. Cardinals like to cover themselves in ants.
4. Owls devour their prey whole.
5. Some ducks sleep with one eye open.
6. In ancient Greece, pigeons delivered the results of the Olympics.
7. Parrots can learn to say hundreds of words.



Save Vultures

Darwin might have called them 'disgusting.' But vultures are more vital than vile. The scavengers do the dirty work of cleaning up carcasses after death, that otherwise could rot and spread pestilence. With their numbers plummeting, we're learning how much we need to keep them alive.



Birds that do not fly

The concept of flight is intimately connected to birds, but not all birds fly. There are about 40 flightless species of birds living today. Most living forms belong to the order Struthioniformes (a.k.a. Ratites, which contains birds like the ostrich, the rhea, the cassowary, the kiwi, and the emu) and the order Sphenisciformes (contains penguins).

Evolution

Many flightless birds evolved on small islands, where there are no mammal predators to fly away from. These birds include the Flightless Cormorant on the Galapagos Island, the now-extinct Dodo bird of Mauritius, many species of rails (small marsh birds), and New Zealand's famous Kiwi birds.

Morphological features

Birds like Ostriches, Emus and Cassowaries are simply too large to fly. They do not need flight to escape predators; rather they can run faster or defend using powerful claws. Several birds choose to swim instead of flying. Penguins, for instance, have wings evolved into narrow paddles they use to swim.

Flying birds have a keel, which is a main site of attachment for flight muscles. Ratites do not possess this keel, and

its absence is one reason why the group's muscles are unsuitable for flight. Penguins, on the other hand, have retained the keel, but it has evolved to accommodate the birds' flightless aquatic existence.

Significance

Flightless birds are used for their meat, oil and leather. Emu oil is said to hold medicinal healing properties for joints and arthritis. Some birds are of national significance attributing to its identity as the national bird (Kiwi -New Zealand; Emu - Australia).

Human Impact

Increase in human exploration, poaching and deforestation has lead to substantial habitat loss for these species. Flightless birds are mostly seen in places where there are no predators. However, with human settlement, many predators including dogs, foxes and cats destroy their nests, eating their eggs. Some birds are preyed upon by animals like crocodiles, jackals and hyenas and are hunted by humans. In the case of penguins there are no land predators; however they are at risk at sea from predators like the seal and sharks.

S Ranjith, *Product Engineering, Pentair Sanmar, Viralmalai.*



The Homely Birds

"If I could fly" is a familiar phrase used to describe our wish. It makes us recall our slam books of student life. Birds are undoubtedly, a species that are empowered with a gift to fly in air. They are one such wonder in God's creation. Their appearance and abilities are admired by many of us. It is also common that some birds are grown domestically for their beauty, meat, medicinal purposes, etc.



Chicken

Chickens have a life span of 7 to 8 years. Females over a year old are known as hens and younger females as pullets. Adult male chickens over the age of one year are primarily known as cocks. In America & Australia, they are known as Roosters. They often scratch at the soil and feed on seeds, insects and even lizards, small snakes, young mice etc.

They are killed for their meat. They provide us with egg. Hens will often try to lay in nests that already contain eggs and have been known to move eggs from neighbouring nests into their own.

Pigeon

Pigeons were used as a mail medium (messengers) in olden days. Their life span is around 5 to 8 years. Research say that domestication of pigeons occurred 10,000 years ago. Rock pigeons are the world's oldest domesticated birds. Pigeon meat is known as squab. They are hunted for their meat. Trained domestic pigeons are able to return home even if released at a location they have never visited before and that may be up to 1000 km away. Pigeons feed on grains, seeds, greens, berries, fruits, and will occasionally eat insects, snails and earthworms in the wild.



J Ashwin, *Planning, Xomox Sanmar, Viralmalai.*

Wild and Dangerous Birds in the World



Australian Magpie: This medium-sized bird lives in grasslands, fields, parks and gardens across Australia. In spring, when nesting period arrives, the Australian magpie becomes very aggressive to protect its nest and attacks fearlessly. As the habitat of the Australian magpies includes residential areas (streets and parks), you need to be careful if you stay near them.

Mute Swan: Weighing up to 28 lbs, the mute swan is one of the largest waterfowls native to Europe. They live in ponds, rivers, wetlands and inland lakes. The wingspan of this large bird also measures up to 2.4 m. The cuteness of mute swans may force you to go near them. But keep in mind that they are aggressive and can pose danger to you.



Southern Cassowary: It is probably the most dangerous living bird in the world. It's a bird which could definitely cause a fatal attack on humans, just like ostriches. Considering the size, Southern Cassowary is the second largest bird in the world – weigh between 75 – 80 kg and up to 5.1 ft in height. Like ostriches, the legs are the most powerful weapon of cassowaries.

Great Northern Loon: It is a large diving bird which also known as common loon. They have a length between 24 to 39 inches and wingspan up to 60 inches. These migratory birds spend their summer in lakes and ponds in Northern United States, Canada and Greenland. In winter, they migrate to South, to Pacific and Atlantic coastlines.





European Herring Gull: Measuring up to 26 inches in length, European herring gull is a large gull found across Western Europe. These gulls are notorious for both stealing food and attacking humans. They have a wingspan of 49–61 inches and razor-sharp bills. So, serious injuries arise from the herring gull attacks.

Ostrich: The flightless ostrich is the largest living bird on Earth. Native to Africa, ostriches inhabit Savannas, deserts and grasslands across the continent. A fully grown ostrich weighs up to 150 kg and stands 6 ft tall. At a top speed of 43 m/h, it is also the fastest bird in the world. The long, powerful legs are the main weapon of an ostrich. Unlike other birds, ostriches have only two toes on each foot.



Barred Owl: It is a large, round-headed owl which is widespread in North America. They prefer to live in forests and woodlands. Barred owls are nocturnal birds and thus hunt only at night. The most interesting thing about barred owl is their way of flying noiselessly through the dense forest. It is due to the speciality of their feathers.

V Jaya Vishagan, Purchase, Xomox Sanmar, Viralimalai.

Do you know my name?



Guess the name of the bird and where it can be found.

Send in your entries to scribbles@sanmargroup.com



We are visible only under a microscope!

Algae

Algae are aquatic, plant-like organisms found residing in oceans, lakes, rivers, ponds and even in snow. They can be found just about everywhere where there is light to photosynthesise and water for reproduction. If life exists elsewhere in our solar system, an alga-like organism is among the most likely to be found.



Virus

A virus is a non-cellular organism made up of genetic material and protein that can invade living cells. In the year 1897, a scientist named Beijerinck discovered and coined the term virus. The term virus is derived from Latin word 'virus' meaning poison.

Viruses are very small and they are measured in nanometers. They can only be seen with an electron microscope. They are composed of a core of DNA or RNA surrounded by a protein coat they can only reproduce by infecting living cells. Their size ranges from 20 nm to 250 nm.

Advantages of Virus

- Important function in marine ecology and carbon cycling.
- Viruses have been useful in the study of molecular genetics like DNA replication, RNA processing, transcription, translation, protein transport and immunology.
- In genetics, viruses are used as vectors to introduce genes in the cell which are the case of study.
- Virotherapy is another use of virus where they are used as vectors to treat various diseases.
- They are used in the treatment of cancer and in gene therapy.

Usefulness of Algae

- 1) Algae can double their numbers every few hours, can be harvested daily, and have the potential to produce a volume of biomass and bio-fuel many times greater than that of our most productive crops.
- 2) Like any other plant, algae, when grown using sunlight, consume (or absorb) carbon dioxide (CO_2) as they grow, releasing oxygen (O_2) for the rest of us to breathe. For high productivity, algae require more CO_2 , which can be supplied by emissions sources such as power plants, ethanol facilities, and other sources.
- 3) Algae can purify water. They thrive in nutrient-rich waters like municipal waste waters (sewage), animal wastes and some industrial effluents, at the same time purifying these wastes while producing a biomass suitable for bio-fuel production.
- 4) Algae can be cultivated to produce a variety of products for large to small markets: plastics, chemical feedstock, lubricants, fertilisers and even cosmetics.

Algae can contain high levels of oils, carbohydrates, sugars and proteins, and can be used to produce renewable fuel, animal feed and even human food.

In short, fuel, feed and food derived from algae can help provide the answer to many of our pressing problems. That's why billions of dollars are being invested in the research and development of algae-based technologies. It won't be long before fuels made from algae will start replacing petroleum fuels in your tank. Indeed, petroleum in large part derives from algae that grew millions of years ago.

Sapan Kumar T, Sales, *Pentair Sanmar, Mumbai.*

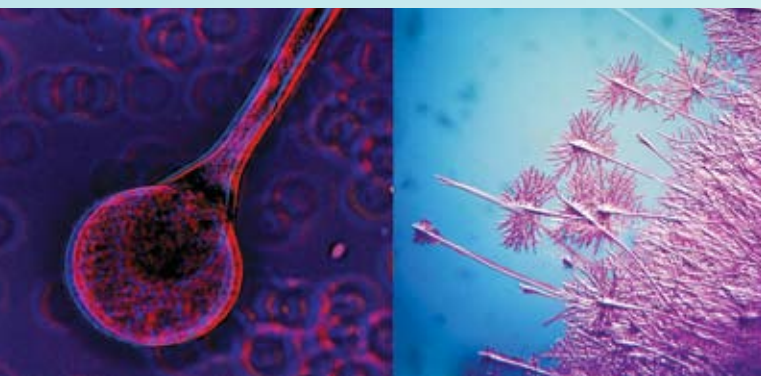
- Because of their shape, size and defined chemical structure, viruses are used as templates for organising materials on a nano-scale.

Disadvantages of Virus

- In humans, viruses causes a wide range of diseases which include HIV, chickenpox, influenza, avian flu, cold, sores and common cold.
- Viruses can be transmitted from horizontally, i.e., from person to person, like from mother to child. They can be vertically transmitted like in the case of hepatitis B and HIV.
- Viruses can cause cancer in humans and other species. Viruses that cause cancers in humans are included in the genotypes of human - papilloma virus, hepatitis B virus etc.

Doshi Darshan Vinodbhai, Sales, *Flowserve Sanmar, Jamnagar.*





Fungi

The variety and galaxy of fungi and their natural beauty occupy prime place in the biological world and India has been the cradle for such fungi. Only a fraction of the total fungal wealth has been subjected to scientific scrutiny and mycologists have to unravel the unexplored and hidden wealth. One third of the fungal diversity of the globe exists in India. Fungi are beautiful and play a significant role in the daily life of human beings besides their utilisation in industry, agriculture, medicine, food industry, textiles, bioremediation, natural cycling, as bio fertilisers and many other ways. Fungal biotechnology has become an integral part of the human welfare. The number of fungi recorded in India exceeds 27,000 species, the largest biotic community after insects.

Useful Activities of Fungi

- They are used in medicine as antibiotics, alkaloids, steroids, vitamins and other compounds.
- They are used in food due to their high protein content and very little amount of fat.
- They are used in industry in the production of alcohol, bread, cheese, enzyme and organic acids.
- By decomposing the organic matter, fungi help in increasing minerals and other substances, thereby the fertility of soil is increased.
- Gibberellin, an important phytohormone produced by Gibberella fujikuroi, the pathogen of Bakane disease of rice, has been used to enhance growth of many plants.
- Fungi like Cordyceps melontheae, Aschersonia aleyroidis, Empusa sepulchralis etc., are used as insecticides to control different types of insects.
- Fungi like Neurospora, Yeast etc., have been used in genetical and cytological studies. Physarum polycephalum has been used to study DNA-synthesis and morphogenesis.

However, the hallucinogenic substances may destroy brain cells and distort of the perception power of humans.

Dr. Darshika Shah w/o Mr Nayan M Shah,

Regional Sales, Flowserve Sanmar, Baroda.

Bacteria

Bacteria were among the first life forms to appear on Earth, and are present in most of its habitats. Bacteria constitute a large domain of prokaryotic micro-organisms. Typically a few micrometres in length, bacteria have a number of shapes, ranging from spheres to rods and spirals. Bacteria inhabit soil, water, acidic hot springs, radioactive waste, and the deep portions of the Earth's crust.

Bacteria were first observed by Antoine van Leeuwenhoek in 1676, using a single-lens microscope of his own design. He then published his observations in a series of letters to the Royal Society of London. Bacteria were Leeuwenhoek's most remarkable microscopic discovery.

Use of bacteria

The nutrient cycle includes the decomposition of dead bodies and bacteria are responsible for the putrefaction stage in this process.

Bacteria provide the nutrients needed to sustain life by converting dissolved compounds.

In industry, bacteria are important in sewage treatment and the breakdown of oil spills, the production of cheese and yogurt through fermentation, and the recovery of gold, palladium and copper.

Harmfulness of bacteria

Several species of bacteria are pathogenic and cause infectious diseases, including cholera, syphilis, anthrax, leprosy and bubonic plague.

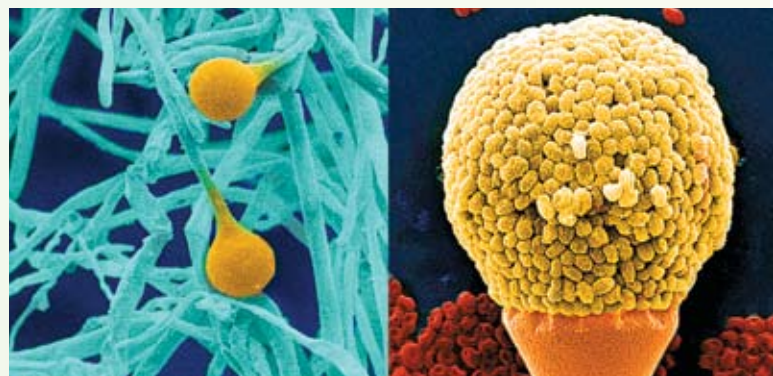
Most of the bacteria can cause food spoilage.

Without bacteria we would be surrounded by garbage and rotting dead things, we would not be able to digest our food and our bodies would not build immunity.

Bacteria and fungus are responsible for breaking down waste in all forms and turning it back into its base elements. Small insects help with this but most decomposition of dead or discarded organic matter like food is broken down by our microscopic buddies.

Nirav Suresh Vadgama,

Sales, BS&B Safety Systems (India), Mumbai.





Fish - The Colourful Aquatic Kingdom

Our aquatic world is home to a richly diverse collection of the world's most fascinating aquatic species. Amongst the thousands of species within water, the fish play a very important role in the life of humans.

Fish are abundant in most bodies of water. They can be found in nearly all aquatic environments, from high mountain streams (char and gudgeon) to the depths of the deepest oceans (gulpers and anglerfish). With 33,100 described species, fish exhibit greater species diversity than any other group of vertebrates.



Pros

With characteristics such as a built-in radar, ability to detect minute temperature differences, ability to smell through nasal sac, fish are really important to humans.

Economic importance

Fisheries are a huge global business and provide income for millions of people. The annual yield from all fisheries worldwide is about 154 million tons, with popular species including herring, cod, anchovy, tuna, flounder and salmon.

Cons

High metallic content

Some fish, such as king mackerel, shark, and swordfish, are consistently high in mercury which can harm the nervous system of a foetus or young child. Certain other fish, including canned light tuna, are also occasionally high in that metal. While the health effects of sporadic exposure are unclear, our fish safety experts think that women who

are pregnant, as well as young children, should take special precautions.

Hemorrhagic stroke risks

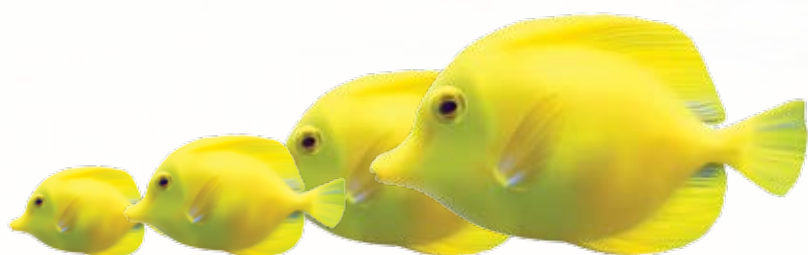
Consuming more than three grams of omega-3 fatty acids is, according to the University of Maryland Medical Center, equivalent to having three servings of fish a day. The centre notes that this can put you in danger of developing hemorrhagic stroke. This type of stroke occurs when one or more arteries in your brain rupture and cause a life-threatening haemorrhage.

Toxicity problems

Environmental pollutants such as arsenic, lead, mercury and cadmium in waterways can accumulate in fish. These metals may be difficult to eliminate through some industrial processes used in the manufacture of fish oil supplements and ingesting them can cause cognitive impairment and nervous system dysfunction.

1. Some fish, like The Triggerfish can swim backward.
2. Most brands of lipstick contain fish scales.
3. Many fish can taste without even opening their mouths.
4. Many fish species are known to change sex during the course of their lives.
5. Sharks kill 12 people per year while people kill 11,417 sharks per hour.
6. Goldfish can see infrared radiation that is invisible to us.
7. There is a shark in Greenland that eats Polar Bears and can live up to 200 years.
8. One Puffer Fish contains enough poison to kill 30 people.
9. Fish can drown in water.
10. 'Rain of Fish' is an annual weather event in which hundreds of fish rain from the sky onto the city Yoro in Honduras.
11. Fish in polluted lakes lose their sense of smell.
12. Goldfish can distinguish the music of one composer from another.

Bhavya Gupta, Sales, Flowserve Sanmar, Delhi.



The Water Dwellers - Whales, Sharks and Dolphins

Whales are a group of aquatic mammals, believed to be living on Earth for more than 34 million years. They prefer to live far away from the shores, and are extremely fond of life underwater.

Whales are large in size, ranging in length from 9ft (the dwarf sperm whales) to 98ft (blue whale). Whales are carnivorous, but are less aggressive hunters, mostly feeding on fish, krill & other planktons. Whales have a normal life-span, ranging from 29 years (for Killer whales) to 50



years (for the Humpback whales). Our fascination with whales has existed since ancient times. Whaling (whale hunting) by humans has existed since 2000 B.C., usually for their meat & blubber (a layer of fat inside their skin). Earlier hunters used 'Harpoons' to spear these whales out of the water. English literature has references to the fictional 'Moby dick' (a white whale in the story), and how whales were fanatically hunted by humans during those days. However, in 1946, the International Whaling Commission had placed a limit on whale catch for each country, to ensure survival of the species. There have also been instances, where oil spillages in the sea, from tanker ships have affected whales, leading them to wash up dead on the shores.

Dolphins, like whales are classified as aquatic mammals, believed to be living on Earth for more than 40 million years. Dolphins range in size from 5.6 ft to 31 ft (some killer whales are also classified as dolphins). With



Sharks are classified as 'fish', characterised by their 'cartilaginous' skeleton. Studies show that the earliest known species of sharks date back to nearly 400 million years. Since then, there are evidences of over 500 different species of sharks to be living on Earth. Sharks range in size from as small as 7 inches (lantern shark) to as large as 40 ft (whale shark). Sharks are commonly found in sea water, however a few species have been found to live on fresh water as well (bull shark & river shark).

Sharks have an average life-span of 20-30 years. Sharks are carnivorous, feeding on fish & other aquatic life. A few species of sharks also have the honour of being called 'apex predators', due to the swiftness in the way they attack their prey. (Steven Spielberg's 'Jaws' movies have enough evidence to prove this!) Human interactions with sharks are normally limited to aquariums, although there have been few incidents reported of sharks attacking humans in rivers. Sharks also feature prominently in Hawaiian myths, with a few species worshipped as Gods. It is estimated that nearly 100 million sharks are being killed for commercial & recreational fishing every year. Sharks are also common sea-food in Japan & Australia!



a physique that resembles a 'Torpedo', dolphins can travel at speeds up to 60 km/h in water. Dolphins prefer to live in the warm waters of the Tropic region. Fish & squid are considered to be the main diet for these creatures. Dolphins are considered to be highly intelligent and are known to communicate frequently with other species. Dolphins are normally gentle in nature, but when provoked, tend to exhibit violent behaviour. Trained dolphins are also used by the military of certain countries for various purposes, from finding mines to rescuing lost or trapped humans in the sea. The United States Navy Marine Mammal programme still train dolphins (only certain species) to carry out minor tasks. However, it was reported that the army had used trained dolphins in combat operations during the Vietnam and the Iraq wars. Dolphins also form a part of the local cuisine in Japan, Taji & Faroe Islands.

B Shivraman, Sales, Flowserve Sanmar, Delhi.

Under Water Marvels - Seal and Octopus

Students in classrooms with windows that open out to nature in all its glory may perform better on tests. But with the advent of modern technology and booming social media, human beings have nearly nullified their relation with nature.

Co-existence of human life and nature is the least talked about topic in modern world, the lack of knowledge of which has pushed many natural species to the endangered zone and has also caused the bridge connecting human life to nature, to break down and fall apart.

Even before billions of years of human existence, a billion living species existed on earth and they still continue to exist by virtue of their capability to adapt. It is true that the count of the living species has drastically come down but some of them still exist happily.

Octopus

The octopus reveals almost all the characteristics you would want in a biologically inspired adaptable security system. Its use of tools (the coconut shells) and its well-known ability to wreak havoc on laboratory containment systems show that it can learn from a changing environment. The rapidly changing skin cells show it has an adaptable organisation in which a lot of power to detect and directly respond to changes in the environment is given to multiple agents that don't have to do a lot of reporting and order-taking from a central brain. That it has an ink cloud and camouflage and a powerful bite that it uses both for offence and defence reveals its redundant and multi-functioning security measures.

Its ability to deliberately stalk, surprise, and even kill prey much larger than itself shows that it can manipulate uncertainty. Finally, its use of deadly bacteria in its own defence reveals that it uses symbiotic relationships to extend its own adaptive capabilities.

Some octopuses, when spying a potential reproductive partner, will split their missions the half of their body facing the mate will pulse with a psychedelic display of colour, but the half facing the rest of the world (including other competing male octopuses) is dull and inconspicuous, as if to say, "nothing special going on here!" Octopuses learn not only how to survive but how to thrive in almost any environment.



Seal

A seal is no different from people. It can get cold and tired in water and therefore must come to land to rest. If it cannot get the rest it requires, it can go down at sea. From the ancient history of survival of human beings, we came to know that they often migrated from one place to another in search of food and shelter.

So does a seal every day, as long as it lives, overcoming a million hurdles & obstacles that comes its way, in search of food & a better shelter for its family.

The harm that seals can cause to this world is that it can transfer disease to a dog and can get itself infected from a dog. They can teach us to be calm for most of the time of our life when we are absolutely clueless about all our frustrations and we don't find any solution to our queries.

Just an example to how helpful they can be to humans - The United States government has used Sea Lions (seals) to help their scuba diving teams. They also use them to detain scuba divers that are found in areas where they shouldn't be until authorities can get to the scene.



Not all organisms in nature display these characteristics so prominently as the octopuses and seals, but all organisms use them to varying extents to survive and adapt.

Natural organisms have learned to thrive in an unpredictable and risk filled planet without having the power to plan, predict, or try to perfect themselves. Why don't we human beings take a moment to look around us to understand what's happening? Time for some brainstorming gentlemen, to learn from nature - a few better ways to solve our problems and live our life happily.

Ramanjan Ganguly, Sales, Flowserve Sanmar, Kolkata.

Living under water - Seahorses and Turtles

Oceans cover 70% of the earth's surface. Marine ecosystems support a great diversity of life and variety of habitats. The ocean is a major influence on weather and climate. As humans, we rely on the ocean a lot and it's important to help keep the water healthy and monitor it for any changes that could impact the marine life.



Seahorses

Seahorses are usually found in the shallow tropical and temperate waters throughout the world, living in sheltered areas such as sea grass beds, estuaries, coral reefs, or mangroves. In Europe they are known to reside in the Thames estuary. Many of the larger species are living in the Mediterranean Sea. Many species of seahorses are very territorial. The male seahorses can have about 11 square feet of territory and the females can have up to 1100 square feet. Seahorses live in areas that have still water or slow moving water because they cannot swim very well. It can be very dangerous for them when there is a storm as it can affect their habitat.

- Scientists decided that seahorses are fish. They breathe using gills and are classified as 'bony fish', the same group as cod and tuna!
- There are a total of 53 species of seahorses. Some of the smaller species can be under 1 inch in length while the bigger ones can measure up to 14 inches.
- Seahorses do not have teeth - they suck in their food and swallow it fully. They do not have a stomach either, so the food passes through their bodies really fast meaning they need to eat almost all the time.
- Seahorses are really clever and can camouflage themselves into their environment.

Turtles

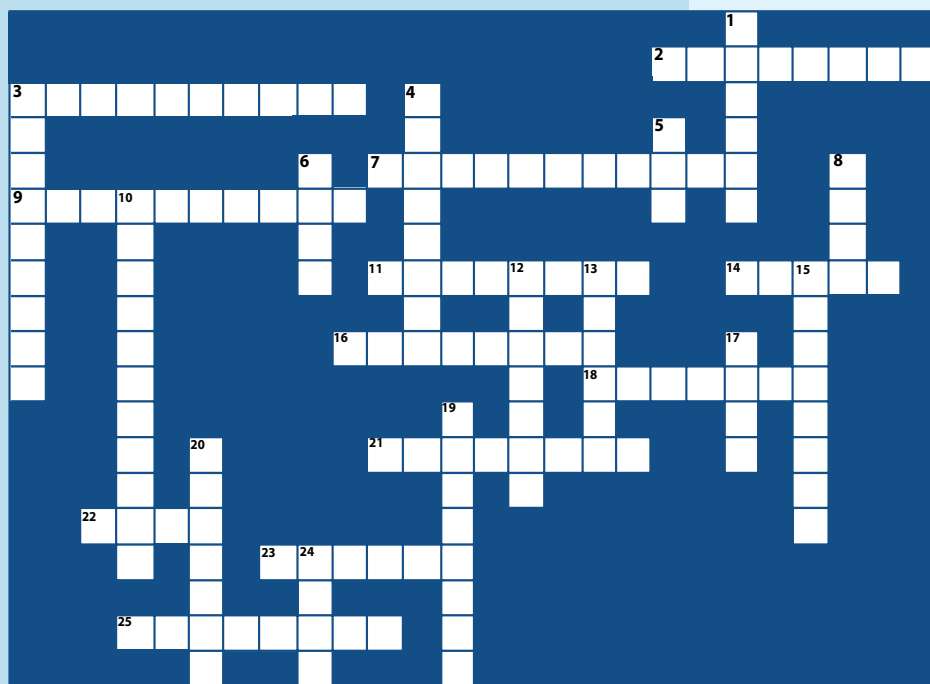
Adults of most species are found in shallow, coastal waters, bays and estuaries. Some also venture into the open sea.

- Leatherbacks can survive in waters below 4° C. They are the largest species of turtle and weigh over 900 kg! They can also travel for more than 10,000 miles a year. Who thinks they would be great at a marathon?
- The temperature can determine whether the egg of a turtle will develop into a male or female. Lower temperatures can lead to a male while higher temperatures may lead to a female.
- Turtles are reptiles and cold blooded. Cold blooded animals get hotter or colder depending on the temperature of the environment they are in.
- Sea turtles have these special glands that help remove salt from the water they drink.
- Turtles have existed for 215 million years. They existed among the dinosaurs! It's thought that turtles were able to survive the meteorite that brought the dinosaurs to extinction all those years ago because they have amazing survival skills; when temperatures get too cold they hibernate, when it gets too hot for them they dig into mud holes and wait.
- Adult green sea turtles are herbivores, but when they are young, they feed on meat like crab and jellyfish.
- The shell of a turtle has 60 different bones all connected together.
- Turtles have good eyesight and an excellent sense of smell.

Somesh Sadhu, Sales, Flowserve Sanmar, Kolkata.



Crossword



Across

2. the phylum to which birds and reptiles belong (8)
3. type of venomous snake, named for its colour (10)
7. small bird that feeds on the nectar of flowers (12)
9. part of the brain associated with balance (10)
11. top of the turtle's shell (8)
14. type of lizard found in car insurance commercials (5)
16. type of bird that is pink (8)
18. type of egg found in both birds and reptiles (7)
21. the state bird of Illinois (8)
22. type of venomous lizard, ____ monster (4)
23. type of constricting snake (6)

Sudoku

		4		8	5		9	6
	5			6	9			
3						2		8
		7			8			
		2				7		
			4			5		
7		1						3
			9	3			4	
9	3		7	1		8		

25. fused collarbone found in birds (8)

Down

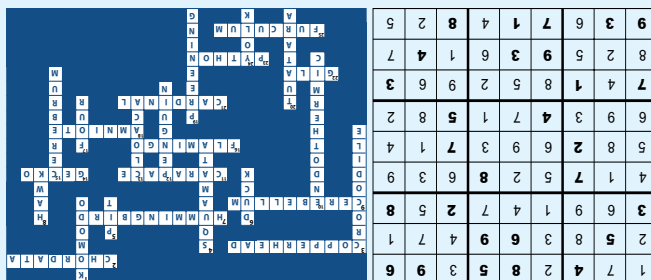
1. largest lizard; ____ dragon (6)
3. reptile that takes care of its young (9)
4. the order to which snakes and lizards belong (8)
5. organ that detects heat in snakes (3)
6. type of bird that Daffy is (4)
8. a large bird of prey; red-tailed (4)
10. another name for warm-blooded (11)
12. bird that lives in the Antarctic, it swims but never flies (7)
13. eggs and waste exit here (6)
15. part of the brain involved in problem-solving (8)
17. number of chambers in a bird's heart (4)
19. bird grooming (8)
20. reptile known as a "living fossil" of New Zealand (7)
24. part of the egg that feeds the embryo (4)

Guess Who?!



He is the English naturalist, geologist and biologist, best known for his contributions to the science of evolution, **Charles Robert Darwin.**

He changed the way humans viewed themselves and the world around them through his amazing ideas on evolution and natural selection.



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