THE ZOOLOGICAL SOCIETY

SRI VENKATESWARA COLLEGE

PRESENTS

PHOENIX

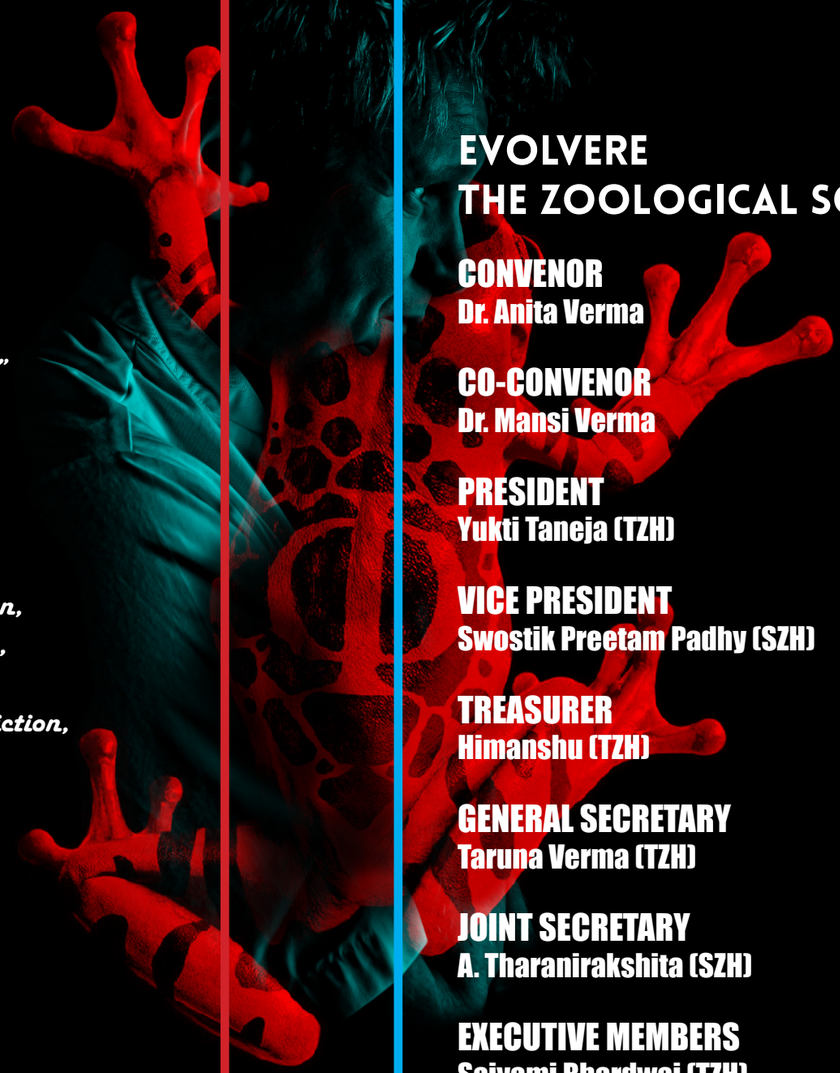
SIXTH EDITION

2017-2018

React

I visited the God's abode in the deep thicket,
Loaded with species set in caskets,
God had a gilded bronze basket,
Brimming with labels and tickets,
He was in a hurry,
And went out in a scurry,
Riding over a horse carried surrey,
Something dropped out in this moment unwary.
It was a piece of paper,
One of those in the casket of golden décor,
It had a frog's picture set in caper,
A brilliant work of nature,
Mentioned below the picture was a date,
October 9, 2028
As I read this out a glimmering golden gate
Opened and I stepped in, realizing, "Is this their fate!"
The site was heart-rending,
The cruel humans harming and the frogs suffering,
All this was quite humiliating and embarrassing,
Being a human being.
Then my face deepened to crimson,
It was after this realization that God came into my vision,
And notified this date to be the frog's day of extinction,
I was astounded and the fact was hard for absorption,
But as time passed I got to know this was not some sort of fiction,
And I decided to contradict this prediction,
By stopping this torture with passion and conviction,
And postpone this vicious situation.
Let's do something solid,
To solve this situation horrid,
Let's make a solemn promise,
And bring to frogs - peace, comfort and solace,
Come on! It's time to act fellows,
Our priorities need to be narrowed,
From games, gadgets, clothes and stilettos,
To toads, salamanders, newts and the frogs green and yellow.
Come on! It is time to act,
Don't just sit and relax,
Go read on and react!

By
Harshita Rupani, FZH



MEMBERS

PATRON
DR. P. HEMALATHA REDDY
(PRINCIPAL)

EVOLVERE
THE ZOOLOGICAL SOCIETY

CONVENOR
Dr. Anita Verma

CO-CONVENOR
Dr. Mansi Verma

PRESIDENT
Yukti Taneja (TZH)

VICE PRESIDENT
Swostik Preetam Padhy (SZH)

TREASURER
Himanshu (TZH)

GENERAL SECRETARY
Taruna Verma (TZH)

JOINT SECRETARY
A. Tharanirakshita (SZH)

EXECUTIVE MEMBERS
Saiyami Bhardwaj (TZH)
Monika Yadav (TZH)
Ishita Agrawal (SZH)
Riya Singla (SZH)
Shriya Bhattacharya (FZH)
Bhawna Yadav (FZH)

PHOENIX
THE MAGAZINE SOCIETY

CONVENOR
Dr. Mansi Verma

CO-CONVENOR
Dr. Anita Verma

EDITOR-IN-CHIEF
Ananya Banerjee (TZH)
Mrigya Kaushik (TZH)

CREATIVE HEAD
Akhil Sadiq (TZH)

EDITORS
Urja Kalyani (TZH)
Aparna (TZH)
Soumya Mallick (SZH)
Sukanya Bhuyan (SZH)
Ankita Saha (FZH)
Anushka Saxena (FZH)
Harshita Rupani (FZH)

PHOENIX VOLUNTEER
Stuti Singh (FZH)
Twinkle Kathuria (FZH)
Priyamvada Singh (FZH)

VOLUNTEERS
Khushboo Kumari (TZH)
Isha Sharma (TZH)
Vivek Kumar (TZH)
Kanishka Besoya (SZH)
Divyanshi Soni (SZH)
Khalid Bashir (SZH)
Nikita Golaya (SZH)
Dipasha Singh (SZH)
Anurag Jaglan (SZH)
Kapil Jain (SZH)
Mehak Pandita (SZH)

TEACHERS' TABLOID

Specialised in
Endocrinology and
Pesticide Degradation

A smile brighter than sunshine
Exhibits a disciplined persona
Must turn in your files on time
She is Mrs. Ramaa Sinha

Specialised in
Endocrinology

24x7 helping students
Inspiring a good morale from the start
A teacher, a mentor and a friend
He is Dr. P. S. Dhanaraj

Specialised in
Entomology

Elegant and punctual
Impresses class with her persona
Giving lectures that are highly factual
She is Dr. Anita Verma

Specialised in
Entomology

Jells in everywhere because of
Her fun loving nature
Every class is a conversation with her
She is Dr. Vartika Mathur

Specialised in Molecular
Biology

His sense of humor is quirky
And entertains the entire class
With dance moves that are praise-worthy
He is Dr. Om Prakash

Specialised in
Fish Biology and Fish
Endocrinology

His sarcasm gives us all a laughing fit
In class he practices utmost discipline
Known for his quick wit
He is Dr. Ajaib Singh

Specialised in Molecular
Biology and
Bioinformatics

Story-telling is his strong suit
With his jokes, he lightens up the mood.
A personality that connects with us all
He is Dr. Rajendra Phartyal

Specialised in
Reproductive Biology
of Fishes

Fulfills all responsibilities
With effortless charisma
Helping students is her priority
She is Dr. Mansi Verma

Specialised in
Fish Biology and
Aquaculture

Believes in laying a foundation
For Concepts to be learnt by heart
Teaching with wholesome passion
He is Dr. P. Jayaraj

Specialised in Cancer
Biology

Shares his college times anecdotes
His friendly nature is his greatest power
Best described as calm and composed
He is Dr. K. Bronson Kumar

Specialised in
Entomology

Full of fun tales,
In his class, you'll never be bored
His knowledge is deep as the sea
He is Dr. Riyaz Bakshi

Specialised in
Neurophysiology

Her bubbly, infectious smile
Helps students through trouble
Cheerful and bright
She is Dr. Vagisha Rawal

Specialised in
Microbiology

There's elegance in his words
And discipline in his manners;
He seems to know it all
He is Dr. Manoj Jaiswal

Specialised in
Neuroscience

Her nature of benevolence
Reflects her positive aura
Having a warm and welcoming essence
She is Dr. Richa Misra

Specialised in
Fish Endocrinology

Brings light to dull lectures
Encourages us to aim higher
Is still in touch with student-culture
She is Dr. Namita Nayyar

Specialised in
Molecular Biology

Sweetness and wit
With a dab of grit
Loved by us all
She is Dr. Preeti Khandelwal

IF ALL THE HUMANS WERE CLONES

Author's note: Recently it was in the news that the famed actor Barbra Streisand known for her role in Funny Girl, "revived" her dead pet dog by cloning. Now she has two of them. This set my imagination conjuring up a world full of human clones.

What would the world be like
If all the humans were clones?
There will be no John or Mike,
If all of them happened to be Joans

A clone would need no mirror,
To make up her pretty face,
With hundreds of them like her
No wrestling to win nor a race

No handsome hunk or beauty queen
Will there be any to compare
Ads for cream would have lost their sheen
As all shall be dark or fair

So what else will the world lack
If Joanses were alone to abound,
There shall be no Jake or Jack,
No spice to life will there be found!

"The cloning experiment has failed."

--- Mrs. Ramaa Sinha
Associate Professor- Zoology
Sri Venkateswara College

FROM THE **PRINCIPAL'S DESK**

Dr. P. Hemalatha Reddy
Principal

శ్రీ వేంకటేశ్వర కళాశాల
Sri Venkateswara College
(University of Delhi)
NAAC 'A' Accredited, DBT Star Status
Benito Juarez Road, Dhaula Kuan, New Delhi-110021
Ph.: 011-24112196, 24118590, Telefax : 011-24118535
principal@svc.ac.in

Date: 05.03.2018

Department of Zoology has always excelled at academics and in extracurricular activities alike. The department is not only known for its chirpiness, but also for their cordial nature. The department always keeps buzzing with events that include informative talks, interactive workshops and some fun games which are all organized by its society, Evolvere.

The Zoology Department has a very loving and welcoming aura, where the teachers are well connected with their students and guide them at every step.

The department often conducts educational excursions and visits to National parks, Institutes and Lectures in Delhi and around the nation. This year, students visited Ranthambore and Mussoorie for the excursion.

The annual magazine, Phoenix is the result of immense hard work and dedication of the students and teachers alike.

I congratulate the team on their 6th successful edition of the magazine and wish them well for future endeavors.

PRINCIPAL

From The

Convenor And Co-Convenor

As we have stepped into the 45th Year of the establishment of Zoology Department at SVC, we feel proud of our academic and research achievements along with the extra-curricular events the department hosts. The year 2017, saw one such event which centered a highly informative talk by Dr. Pankaj Seth, NBRC, New Delhi; and a Health Camp by Fortis Health Care, which saw enthusiastic participation by students and teachers alike. A special camp for Organ Donation was also set up by NOTTO; to raise awareness and empathy amongst students and faculty.

This year's annual event has marked its beginning with lecture sessions on mental health awareness and Autism, as well as some interactive sessions titled 'MAD'17'. Another lecture and interactive session on "how to make a drug" by Dr. Jasminder Sahi, Senior Director and Head of Translational Medicine and Exploratory Development, Sanofi, China was recently organized by our society in February 2018.

This year marks the proud unveiling of the sixth edition of our magazine 'Phoenix'. Phoenix encompasses the hardwork and creativity of our department's students whilst updating others of the newest advancements in the field itself. A medium serving educational and innovative purpose, Phoenix is the product our editorial team is proud to present to our readers.

We realize this would not have been possible without the support and guidance of our Principal, Dr. P. Hemalatha Reddy. We would also like to thank all the society members, and all the department members who worked hard and offered help time and again. Wish we keep on inspiring our students and readers time and again.

Thank you, all.

Dr. Anita Mansi Verma

FROM THE EDITORS

The pages that follow are not mere words but an enormous effort of numerous students under the guidance of our convenor and co-convenor. Through this edition, we have tried to bring forward scientific information and make it relatable for readers from other fields. Making this magazine gave us an opportunity to go beyond the curriculum and explore the beautiful universe of knowledge that science presents. From space to earth; drugs to dragons; birds to snails; mermaids to microbes; we've tried to incorporate all diverse themes and ideas in the following pages. We have tried our best to display the beauty that science is and present it in the best way possible.

We would like to thank our team for bearing with our fickle minds and finicky requests. Working together, we first learned to work as a team ourselves, keeping aside our differences, and then to lead the rest of the team. In the entire process we were aided by Niharika Mukherjee, the former Creative Head. Overall, this was a lovely experience and we hope we succeed in entertaining and amazing you with the knowledge that we have been able to fit into this magazine.

Thank you.

Ananya Banerjee, Editor-in-Chief
Mrigya Kaushik, Editor-in-Chief
Akhil Sadiq, Creative Head

Contents

FOLKLORE GENESIS

Sukanya Bhuyan, SZH

KING COBRA AND MONGOOSE

It is believed that mythology explains the natural world but more often myths are metaphors in the real world. There are some mythical creatures whose existence seems impossible. But what or rather which actual animal must have aided people's imaginations that concocted these creatures?

Remember the gigantic, deadly serpent called Basilisk in Harry Potter whose single, direct glance was lethal and indirect stare could petrify someone? According to some other European legends, the Basilisk is instead the union of serpents and roosters, so it has both the animals' characteristics. It is known as the 'King of Serpents' and has a crown-like crest on its head and its breath is venomous. Its only enemy is the weasel, whose odour is its weakness. The King Cobra must have given rise to idea of the Basilisk. It can spit venom from a distance and has a crown-like symbol on its head. The weasel is analogous to the mongoose which is the Cobra's natural predator.

Centaurs are mythical creatures with an upper torso, head and arms of a human and lower body of a horse. In Greek mythology, they are portrayed as chaotic and they often act under the effects of alcohol. Horses are a vital force in human culture; they are used to a great advantage in wars. The notion of the centaurs must have come from the non-riding culture perceiving the nomads mounted on horses for the first time.

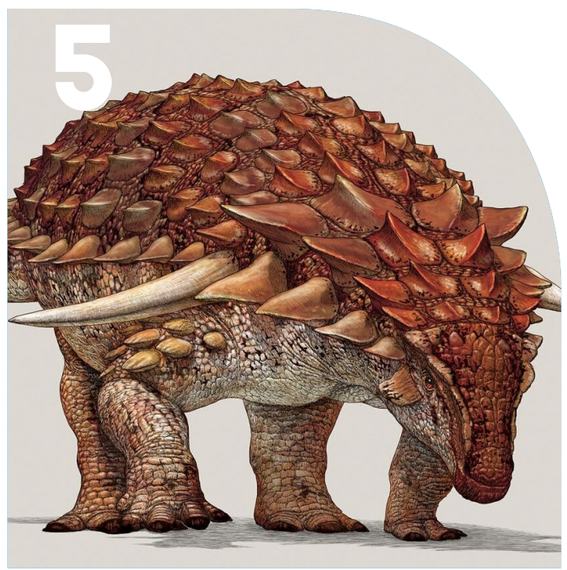
Another half-human, half-animal creature is the enchanting mermaid who has an upper body of a woman and a fish tail from the waist down. Many medieval sailors have reported mermaid sightings including Christopher Columbus who wrote on his journal that "they rose well out of the sea; but they are not so beautiful as they are said to be, for their faces had some masculine traits", which is reasonable because he most probably mistook manatees (sea cows) or dugongs for mermaids. Although it's hard to imagine these animals as mermaids, one can easily misidentify them from afar for they also rise out of the sea and perform tail stand in shallow water like mermaids. They have forelimbs that contain five sets of fingerlike bones and neck vertebrae that allow them to turn their heads.

The Kraken, said to haunt the seas from Norway through Iceland and all the way to Greenland, is one of the largest and most fearsome sea monster in Scandinavian mythology, which attacks ships with its strong tentacles and resides in the bottom of the sea. Carolus Linnaeus even classified the kraken as a cephalopod. But the animal that originated the kraken myths is the giant squid, *Architeuthis* which can grow up to 13m.

Cyclops is an ugly giant with a single eye in the center of its forehead. A fossil of a giant mammal, *Deinotherium giganteum*, which is a distant relative of today's elephants was found on the Greek island Crete. It has an extremely large nasal opening in the center of the skull. This could have been the outset of Cyclops tales for the Greeks.

A MANATEE

ARCHITEUTHIS



DEBONAIR AT DECEPTION

FROM CONCEALMENT TO IMPERSONATION

Ankita Saha, FZH

Adapting to changes in environmental factors is the key to better chances of survival in the wild. Such an adaptation is camouflage, that allows an organism to mask its location, identity and movement for defence or for approaching a prey. Let us take a look at some fascinating examples of camouflage that animals have evolved to exhibit.

1.Background Matching

It is a camouflage tactic used by animals to exhibit colours and patterns resembling their natural habitat.

The Baron caterpillar which feeds on mango leaves is green with a dorsal yellow stripe. It looks like a bunch of pine needles clumped together but when resting on a leaf, it disappears into the foliage making it almost impossible for a predator to spot it, thus boosting its chances of survival.

2.Disruptive Colouration

Some animals exhibit highly contrasting, non-repetitive markings such as spots or stripes that break the outlines making them remarkably difficult to observe.

Nightjars are ground-nesting birds which show unique markings on every individual. New study carried out in Zambia by scientists of Exeter and Cambridge Universities shows that individual birds choose backgrounds that enhance their camouflage..

3.Mimicry

The pygmy seahorse, of the tropical Western Pacific, mimics the gorgonian coral it inhabits. This brightly coloured animal blends in so brilliantly wasn't discovered until the coral was closely examined in a laboratory.

Animals such as the bat faced toad, dead leaf mantis and the satanic leaf tailed gecko, all closely resemble dead leaves.

4.Adaptive Camouflage

Some animals have the ability to change their colour and patterns in response to their environment and needs. Chromatophores which sit below the surface of the skin are responsible for this change. Some of the examples are cuttlefish, octopus and peacock flounder fish.

Undoubtedly one of the most well-camouflaged species, the Indonesian mimic octopus, found in Indo-Pacific region has the unique ability to combine adaptive camouflage with mimicry and can change both colour and shape to impersonate other animals like sea snakes, lion fish, jelly fish, flat fish etc.

5.Countershading

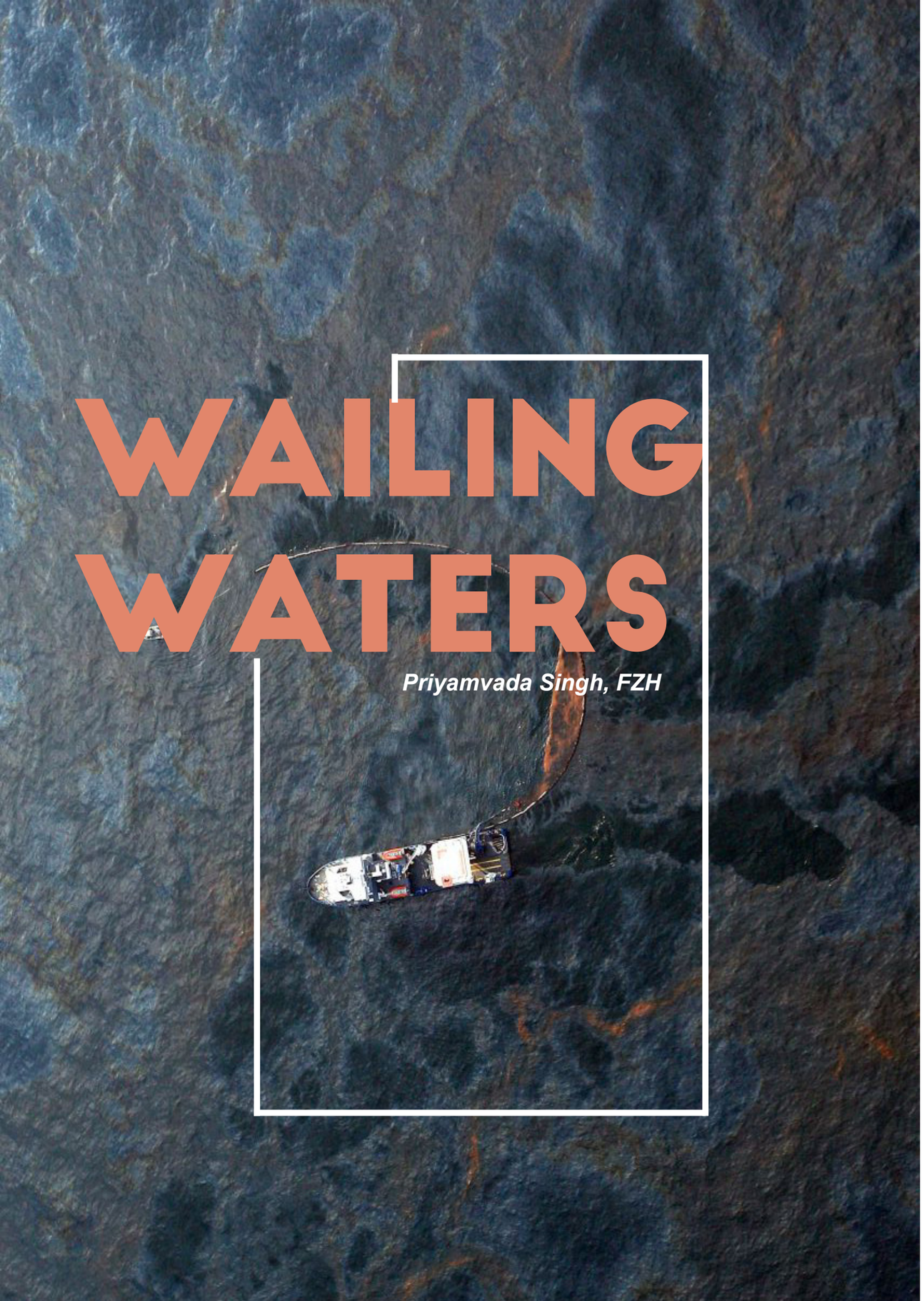
Weighing more than 1300 Kg and having horns and a dense armour of spikes all over it's back, shoulders and face weren't enough to dodge predation for *Borealopelta markmitchelli*, a 110 million-year-old herbivorous dinosaur whose fossiled remains are currently on show at Royal Tyrrell Museum of Palaeontology in Alberta, Canada. Studies suggest that the ginger coloured nodosaur used countershading to disguise itself.

When sunlight shines on an animal, the top of the body is illuminated, casting its belly in shadow. Countershading involves animals being darker on top and paler underneath, thereby distorting the shadow preventing the predators from identifying their shape.

6.Olfactory Camouflage

The ground squirrel, found in the evergreen forests of North and Central America does not rely on visual tricks to evade its predator, the rattlesnake. It seeks out dead rattlesnake skins and applies their scent by vigorously licking its fur after chewing on those skins, thereby masking its own scent.

If one looks closely enough, the animal kingdom serves as a reservoir for numerous such deception mechanisms. Indeed these animals are no less than sneaky little ninjas!



WAILING WATERS

Priyamvada Singh, FZH

How would you feel if one day you woke up only to find your entire house soaked in greasy oil? Weird, right? Oil spill is leakage of crude or refined oil products in the ocean or land. It causes water and soil pollution as well as leads to the destruction of biodiversity.

It causes the reduced growth of the fishes, fin erosion, reproduction impairment and causes greater loss via Bio magnification. Can you imagine it is a tool for "environmental terrorism"? Iraqi forces intentionally released over 300 million gallons of oil into the Persian Gulf in 1991 as part of the offensive in the Gulf War.

Every year 4.9 million liters of oil is spilled in the U.S. waters only. Data show that Atlantic ocean is more prone to such cases. Being surrounded by continents like North America and Europe, it becomes a Hotspot for this. Between 2010-16, almost 39,000 tonnes of oil was spilled in the ocean including the oil spilled by China which was the size of Singapore.

Although most cases of oil spills are accidents still we can do our bit by reducing the exploitation of natural resources viz. oil. There are many fascinating pieces of research being conducted all over the world in order to tackle this problem.

Canadian researchers have come up with the idea of using the seed pod fibers of milkweed plant (belonging to genus Calotropis) for absorption of oil since it is naturally oleophilic and hydrophobic. Apart from being four times more efficient than current clean-up tools, it also supports endangered Monarch Butterfly (solely feeds on milkweed).

USA has designed an oil trapping mesh inspired from lotus leaf which filters the oil in water. The fine hairs on lotus leaves are the ones that aid in this process. Researchers at Southeastern Louisiana University are looking into the oil cleaning abilities of Rangia clam. Being filter feeders, they tend to accumulate bacteria and virus infested water as food within them and spit the remaining out. So, why not the oil and nutrients in water? This is what the innovators are researching at. Hopefully, they succeed in it.

Even the Indian scientists have invented Fluorine rich Metal- Organic-Framework material membrane which is oleophilic, porous and known as a good adsorbent for gases.

So the need of the hour is research and innovation. All the budding scientist out there, it is the time to display your abilities not just for the betterment of our own kind but that of the organisms with whom we share this world.

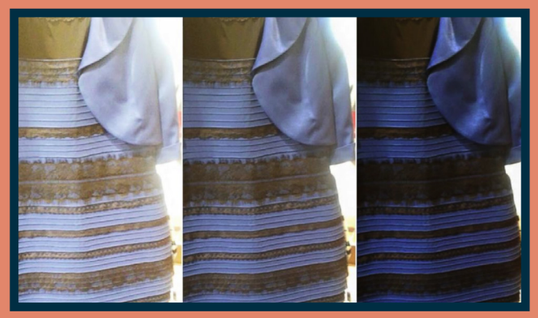
SNIPPET

The Dress that broke the internet

A dress puzzled the internet over its colour- whether it was blue and black or white and gold. But the dress—blue and black or white and gold somehow confuses the group of people. Some brains look at the dress and attempt to discount the blue bit while others try and get rid of the gold parts. This allows people to see both different colors at different times , depending on whichever theiyour brain is more comfortable seeing at. While it's ultimately about what your brain decides it needs to do with the ambient light of the image, the type of cells in eyes will primarily help decide the color.

A followup study published in Current Biology showed that about 57% of the reapondents saw the dress as blue-black, 30% saw it white-gold, 10% saw it blue-brown, 10% saw it switching colour while a negligible number of people saw it blue- gold. It was further found that if the dress was shown under artificial lighting it stimulated blue-black response in majority! How about a colour for your thought?

Stuti Singh, FZH



HOW TO EXPLAIN YOUR DRAGON?

Soumya Mallick , SZH

Tales about this fire breathing majestic yet terrifying creature, have been with us since millennia. They have descended into our imaginations and taken such interestingly varied forms that it is now impossible to not feel intrigued by them. Though no solid proof exists but many have argued that on the fossil front: absence of evidence is not evidence of absence.

Until about 1500 CE people still believed in their existence. In the long run, they represented not only a fearsome beast but shined as symbol of bravery, purity, wisdom, malice, even death. Such contrasting qualities can be explained by the different ways dragon legends are perceived in different cultures.

In Chinese mythology, the Dragon is the most striking beast. The Chinese even proclaim themselves as “Lung Tik Chuan Ren”, meaning ‘Descendents of the Dragon’. A very powerful symbol, the dragon represented all things male, or Yang while the Phoenix depicted all things female, or Yin. The Chinese dragon like the Indian Naga’s, are often associated with water, rain, lakes and rivers unlike the fire-breathing aspect of Western Dragons. Even China’s four great rivers were named after Dragons.

Although there is no concrete evidence as to which creature gave rise to this mythique but three possibilities come up- the Nile alligator, the Goannas of Australia or the extinct giant Titanoboa. Also the only known existing dragons in the world today are the Komodo dragons.

The present image of dragon is a mosaic possessing the body of a snake, the scales of a fish, the talons of an eagle, the antlers of a stag, and the face of a gilin. It is also possible that dinosaur bones may have been mistaken for dragon bones. For example, in a book written by Zhang Qu around 300 CE described dragon bones being excavated in Sichuan Province. Another source of imaginations could be the giant Azhdarchid pterosaurs that were perhaps the largest animals ever to take flight with wingspans up to 36ft (11m), and the group most likely to give rise to real-life dragons. As much as they are revered in China, they are cursed in the West. Their description changes to menacing fire belching reptiles there. The word “dragon” comes from the ancient Greek word “draconta,”meaning “to watch,” suggesting how in folklores they guarded treasures such as mountains of gold coins or gems, though this makes little logical sense: a creature as powerful as a dragon surely doesn’t need to pay for anything. From a scientific point of view, this Dragon hoard could be an elaboration of the male Bowerbird system, with female dragons choosing males with the biggest stack of gold.

A NILE ALLIGATOR

A KOMODO DRAGON

This dramatic mixture of east and west has given rise to fantastical imaginations, like Smaug-the Fire drake, guarding the Lonely mountain treasure in Tolkien’s “The Hobbit” or the Majestic Trio in the critically acclaimed Game of Thrones series. A symbol of Endurance, these scaly armoured beasts won’t be fading away anytime soon.

TREASURING THE SMOG

Twinkle Kathuria, FZH

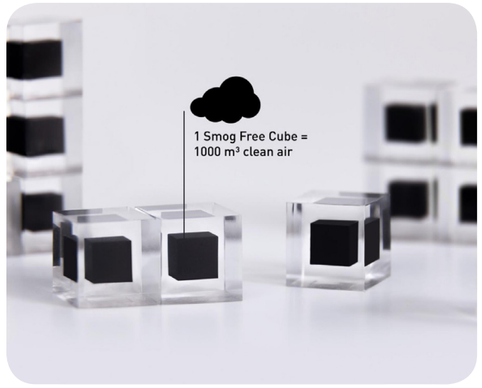
The bleakest problem of the century is air pollution which is the cause of premature death of millions of people each year. The number of deaths is set to double by 2050. Since we are at a loss hen it comes to reducing our pollution output, application of pollution control methods is the next best step.

The pressing need of the hour is developing a control technology that can help to meet the ambient air quality standards. One such tool is the Smog Vacuum. It looks like a hybrid of a space-ship and a traditional Chinese pagoda. It is an air purifier created by collaboration between Daan Roosegaarde, Delft Technology University and European Nano Solutions, which works on ion technology. The tower sends positive ions into the air which attract and suck in small pollution parti-cles. Inside the tower, these particles are attached to a counter electrode. Clean air is expelled out by vents located in the lower part of the tower. The tower roughly cleans air equal to a football stadi-um per day and claims to improve air quality by 75%! Roosegaarde and his team have also found out a method to compress the captured particles to make tiny gemstones, thus reusing the particulate pollutants.

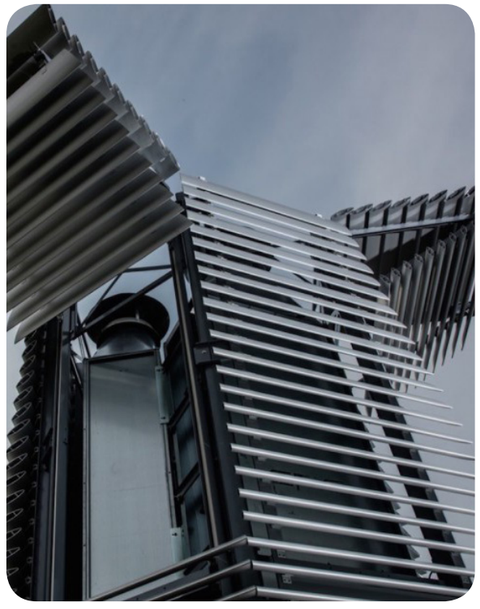
Another such player in the field is EERC's cost effective Mercury Control Technology which removes all forms of mercury from flue gas.

An Advanced Hybrid Filter can remove almost all the fine particles from exhaust gases of coal-fired power plants, incinerators, and mineral- process-ing facilities. It is also used to recapture valuable product from the processed gases in the pharma-ceutical and chemical industries.

Many other such technologies have been and are being developed to help control the pervading pollution. Technology to curb pollution exists, however it's demand does not. Pollution control will become a reality only when people demand it and when nations decide to agree on appropriate international standards.



SMOG FILLED CUBES



SMOG VACUUM

TRANSFORMING THE WAY WE HEAL

The future of organ transplantation

Ankita Saha, FZH

Origami structures may save lives and items from your salad table may regenerate tissues. These are not scenes from a science fiction movie, with trail-blazing scientists using unconventional methods, these may soon be used in mainstream medical treatment. Let us take a look at some astonishing examples that may transform the future of organ transplantation.

1.Tissues grown on leaves:

Just like Popeye, we may be able to turn spinach into muscles. Researchers at the Worcester Polytechnic Institute successfully grew human heart tissue on spinach leaves.

The veins in a leaf resemble blood vessels which the current techniques aren't refined enough to replicate. "I had done decellularization work on human hearts before," the study's lead author Joshua Gershlak said, "and when I looked at the spinach leaf its stem re-minded me of an aorta."

The team removed the plant cells from a leaf to leave behind a frame of cellulose which was then bathed in live human cells to transform it into a mini heart. Mi-crobeads and fluids were then sent through the veins to demonstrate blood flow.

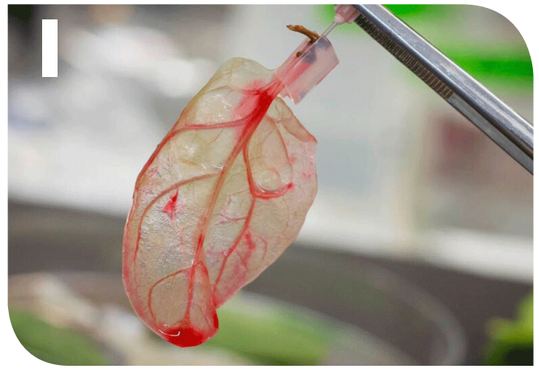
2.Cotton Candy machine capillaries:

Along with making our favourite candy, cotton candy machines have found another purpose. Researchers at Vanderbilt University used cotton candy machines to form threads of poly (N-isopropylacrylamide), or PNIPAM that were about one tenth the diameter of a human hair. The researchers then poured gelatin mixed with human cells on the fibers and hardened the hydrogel in an incubator. The fibers dissolved at room temperature leaving behind a network of tiny channels similar to capillaries.

"The analogies everyone uses to describe electrospun fibers are that they look like silly string, or Cheese Whiz, or cotton candy," said Leon Bellan, assistant professor of mechanical engineering at Vanderbilt University, "So I decided to give the cotton candy machine a try."

3.Origami organs:

Scientists often come across great ideas when they least expect it. A team of researchers in the North-western University stumbled upon the idea of making bioactive "tissue paper" after an accidental spill of 3-D printing ink resulted in a surprisingly strong dry sheet. The new bioactive paper can potentially support natural hormone production in cancer patients and aid wound healing. These versatile and surgical friendly tissues are made from extracellular matrix of natural body organs of cows and pigs and are thin and flexible enough to be folded into origami structures.




1


2

Arthropod orchestra

Harshita, FZH


3


4

The sound reminiscent of childhood picnic trips involved the buzz and croak of the many insects that surrounded us. Although often masked today by the endless cacophony of life, insect sounds must have been amid the most strident and enduring sounds heard by archaic man. Also chant, which is the earliest of human music stands a striking resemblance to the atonal and repetitive insect song pointing towards the great history of how insect noises influence us.

Sound produced by insects is for breeding, luring, courtship and competition. Acoustic signaling has been extensively studied in insect species, which has led to a better understanding of sexual communication and selection. Other intentions for producing sound could be for warning, intimidation, fights and protests.

In crickets, the calling song helps the female find the male and she responds only to the unique, characteristic sound of the male of her own species. Once she is close, the male switches to a courtship song to convince her to mate with him. And, in some cases, the male also sings a post-copulation celebration song. Crickets also sing to establish their area and guard it against rival males. Unlike crickets, both male and female grasshoppers generate sounds to attract mates and to protect their territories. Crickets, katydids and grasshoppers belong to the same order, Orthoptera and employ similar mechanism for sound production. One body part, in this case a wing is equipped with a scraper and the adjacent wing has a rough or file-like structure. Sound is made by moving the two body parts against each other and rubbing the scraper across the file. The file and scraper structure is called a stridulatory organ. Furthermore, the pitch varies with) as well as on the speed of rubbing.

The sound of the cicada is earsplitting and in some species reaches over 100 to 120 decibels while singing. In cicadas only males sing to attract females for mating. They belong to order Hemiptera and have a different sound generating mechanisms. Male Cicadas have a pair of special sound-producing organs called “tymbals” one on each side of its first abdominal segment. The contraction of muscles triggers ribs in the tymbal to bow swiftly generating sounds which are amplified by the air sac in the abdominal cavity. Additional to its breeding and courtship calls, the male cicada creates noise when shocked.

Some termites thump their head against substrate when startled, producing sound and substrate vibrations. Even cockroaches create a hiss when upset. Another instance is the buzzing sound of mosquitoes produced by the beating of their wings during flight, essentially used for communication. Spiders also drum the surface or the substrate during courtship thereby producing sounds.

So, take a moment of silence, and listen to the squeak or buzz or hiss that insects are busy making!

1. A GRASSHOPPER

2. A CICADA EMERGING AFTER METAMORPHOSIS

3. A CICADA

4. MALE AND FEMALE SPIDER DURING COURTSHIP

TICK-TOCK GENES

Soumya Mallick, SZH

Our bodies respond to morning with alertness but yearn for the cozy bed as night approaches. There is a clock ticking away inside us 24x7.

The 2017 Nobel Prize in Physiology or Medicine was awarded to Jeffrey C. Hall, Michael Rosbash and Michael W. Young for expounding the molecular mechanisms in charge of the circadian rhythm. Circadian rhythms refer to the physical, mental, and behavioural changes that follow a daily 24 hour cycle endogenously controlled by a built in clock modulated by external environmental cues also known as Zeitgebers (e.g. daylight).

The scientists pioneering work in Drosophila uncovered the internal oscillators, or clocks, that synchronise the intricate dance between the cellular metabolism and the organismal behaviour:

1. The first gene identified for circadian control was the period (PER) gene by Seymour Benzer in 1971 located on the X chromosome of 3 mutated Drosophila flies. It drives eclosion and locomotor activities in insects. This gene was later cloned and sequenced. Through perseverance and diligent efforts, the molecular mechanisms behind its functioning were worked out. The per gene on the dsDNA in the nucleus transcribes to form the PER mRNA that finally translates into the PER protein in the cytoplasm. This PER protein shuttles between the nucleus and cytoplasm and accumulates inside the former repressing the PER gene expression (negative autoregulatory feedback). But the question as to how the PER protein entered inside the nucleus remained unanswered.

2. Later another protein was discovered, the TIM protein that was coded by the tim or timeless gene. The TIM protein can directly bind to the PER protein to form PER/TIM heterodimers in the cytoplasm that accumulate, and then translocate to the nucleus.

3. Two more proteins were identified and isolated, clock (CLK) and cycle (CYC) proteins. These enabled the activation of PER and TIM genes. They are a part of the genetic transcription-translation feedback loop in *Drosophila*. In the cell nucleus, the CYC protein forms a heterodimer with CLK protein. This CYC-CLK protein complex binds to certain elements in the promoter regions of the genes per and tim, thereby positively regulating their transcription. In the end this circadian feedback loop is closed with PER and TIM acting as negative regulators of CLK activity.

The Climax

The last piece to this puzzle, how the transcription (per mRNA) and translation (PER protein syntesis) is delayed, was solved. The per mRNA is formed in late night but PER protein is syntesised only in the early morning. The underlying mechanism that validated this delay was demystified with the discovery of the doubletime (DBT) protein coded by doubletime gene. The DBT protein leads to the gradual degradation of the PER thus helping in clearing it out. Similarly the TIM protein is degraded by the light-activated cryptochrome (CRY) protein by the cry gene. So when morning arrives TIM is degraded, leaving PER vulnerable to phosphorylation by DBT and its subsequent degradation.

This entire melody of gene and protein interaction in *Drosophila* is known as the Transcription-Translation Feedback Loop (TTFL).

The relevance of their discovery lies in tackling several diseases and disorders relating to the circadian rhythm in humans using *Drosophila* as the model.

SNIPPET

Scary ghosts or Toxic moulds?

What is the one overlapping similarity between the numerous horror movies and folklores? That's right! A spooky, creaky, worn down, ancient abandoned house. People tend to see ghosts not necessarily because a place is haunted but because it might have a lot of fungi moulds growing, breathing which can alter a person's state of mind. Moulds reproduce via spores which act as a potential link between certain toxic moulds and symptoms like -movement disorders, delirium, dementia, disorders of balance and coordination. That creepy feeling in an old spooky place that makes one feel that things just aren't... quite... right could set the scene for one to be on the lookout for ghosts. Some common moulds such as *Claviceps, Aspergillus, Stachybotrys chartarum* cause depression, anxiety and even psychosis in people who breathe them. The brain then plays stuble tricks – a sudden chills, movement in corners of eye, or other ghastly hallucinations. So next time you visit a haunted house wear a mask maybe!

Stuti Singh, FZH

An Animal Cry against Culture

Sukanya Bhuyan, SZH

Humans are affecting wildlife around the world. That is an un-debatable fact. However, sometimes this interference becomes more direct and cruel than hunting or animal husbandry. Nepal's Gadhimai festival and India's Kali Puja undertake a mass sacrifice of animals including buffaloes, goats and chickens to please the Goddess. Naoyu is another such festival from China, where a bull is hung from a tree until it dies to bring the villagers luck and a full harvest. These rituals might sound absolutely absurd to an educated mind but unfortunately, these rituals are still a part of cultures around the world. There are some other ludicrous practices that might have aided the extinction of some species.

Coming closer to home, in India, during Bakra Eid, animals especially goats are sacrificed with the basic philosophy of personal sacrifice and sharing one's belongings with the needier sections of the society and to commemorate Prophet Ibrahim's obedience to sacrifice his 13 year old son Ismael on Allah's command. In many cultures, owls are symbols of wisdom, harbingers of death or bad omens and are even associated with evil, witchcraft and sorcery. In fact, the Romans were so superstitious about these then mysterious creatures that to ward off the evil caused by an owl, it was killed and nailed to the door of the affected house and this tradition existed till the eighteenth century in places like Great Britain. Today in the 21st century, during Diwali, a joyous festival in India, many threatened and critically endangered owls are sacrificed to supposedly win a favour from Goddess Lakshmi. These trafficked owls and their body parts are also used in black magic and various traditional medicines which are sold by the tantriks.

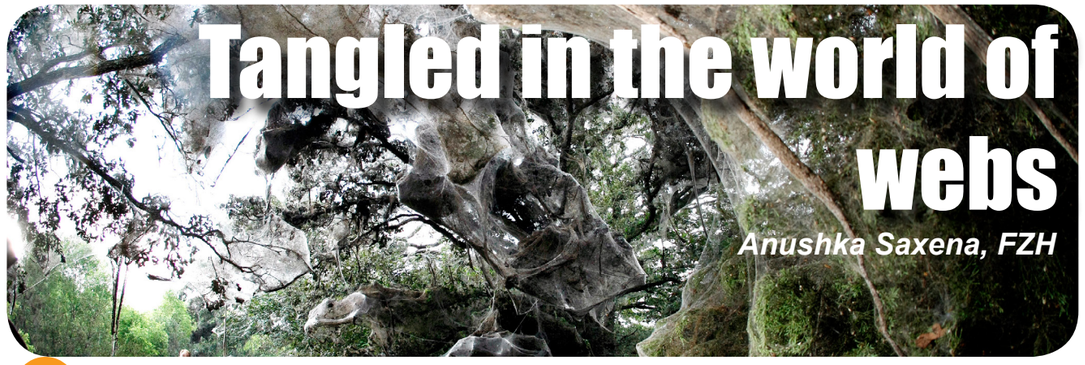
In Madagascar, the only place where the spooky, tiny aye-aye is found, this animal is often killed on sight because the locals believe that it would crawl into their home at night and stab them in the heart with its considerably long middle finger. As a result, the aye-aye is now a near-threatened species in the IUCN Red List.

The Ainu people of Japan worship the brown bear as their God. Ironically, these same people have a ceremony called Iomante, where a cub is grabbed from the wild and nursed to full health for a year or two after which it is tied down in the centre of the village while the villagers shoot it with blunted arrows and other deadlier weapons. After it is dead, it is feasted upon by the villagers and all these deeds are done for pleasing their God.

China is infamous for its illegal trading of wildlife for the Traditional Chinese Medicines which uses the bones of tiger to treat arthritis and other joint ailments, rhinoceros horn to treat fever and convulsions, seahorse to treat kidney ailments and impotence, bear bile to treat liver ailments and what not.

Is it justified to harm or kill animals in the name of religion, culture, tradition or mere superstition? How can we stop the extinction of some of these animals if these cruel practices are left unchecked? Shouldn't it be stopped for at least ethical reasons?

Tangled in the world of webs



Anushka Saxena, FZH

On a brisk Friday afternoon, I sat down to watch a movie, Charlotte's Web. An extraordinary film hung solely on the basis of a very interesting phenomenon. A theme which has long been exploited by film and writing fraternity alike: SPIDER WEBS.

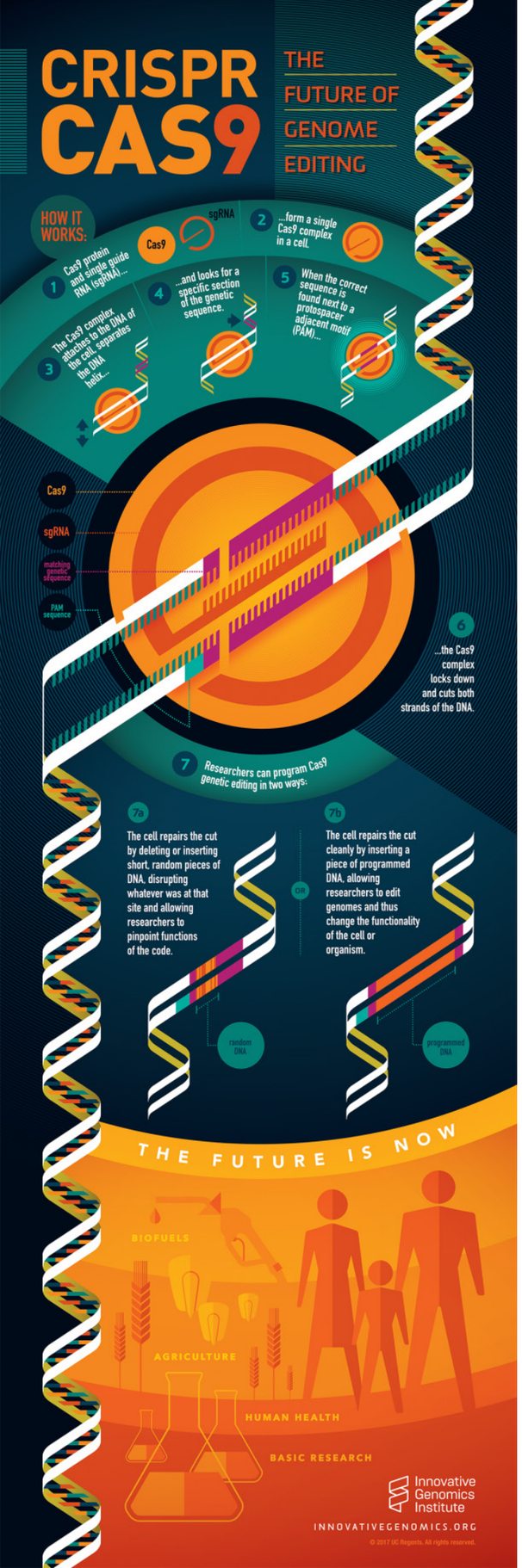
Spider webs are the intricate creations of a spider, made up of silk threads that it secretes. What's more interesting to know is that these silk threads were initially secreted by them for their protection! Studies indicate that when spiders moved from water to land in the Early Devonian period, they started producing silk to protect their bodies and eggs. Later during the course of evolution, spiders gradually started using silk for hunting purposes, guidelines which finally converted to well-known aerial webs.

The secret to the creation of these marvels lies in the anatomy of spider. Its body is divisible into two parts- prosoma and opisthosoma. The latter of which bears spinnerets or spinning organs just anterior to the anus which produce the silk for the web. The silk that it produces is of two types- one that is sticky in nature which is mainly used for creating the basic structure of the web and the other non-sticky for the sole purpose of locomotion of the spider and hence it answers one of the most widely asked question of why a prey gets stuck to the web but not the spider. Interestingly enough, not all spiders make webs! Some of the examples include flower spider, jumping spider, trap door spider etc. Most of the spider webs are created in a vertical plane although some exceptions do exist. Occasionally a group of spiders may build webs together in the same place. For example, in 2007 in Tawakoni State Park in Texas a web created by a group of social cobweb spiders measured around 180m!

As diversity is synonymous with nature, spiders are no different. We see a wide variety of webs in nature with some spiders being classified according to the kind of web it weaves. Spiral orb webs, commonly seen in gardens and familiarized more to the world by Halloween decoration are a special feature of the family Araneidae, Tetragnathidae and Uloboridae whereas the tangle webs or cobwebs with family Theridiidae. Other types include funnel webs, tubular webs, sheet webs etc. which are contributed by various other species of spiders.

Recent studies indicate that the effects of global warming might lead to the formation of SUPER SPIDERS that are faster, bigger and better. So here's to hoping that my next article does not have to cover giant spider webs causing nuisance on the railway tracks!

ORB SPINNING SPIDER



JUGGLING GENE EXPRESSION

Priyamvada Singh FZH

Gone are the days when editing a photo was in vogue, editing a gene is what could soon be trending. Gene editing, in layman's term, is manipulating DNA to achieve the desired objective that ranges from correcting a disease with a genetic factor like asthma or cancer, to making GMO food like Flavr Savr tomato or iron-fortified rice or just fun things like fluorescent zebra fish available as pet on shops. In this technology, we use molecular scissors called nucleases to insert, add or delete DNA bases in living organisms. The basis of all this is the fact that DNA, the code of life, carries encoded information in its nucleotide sequences and by changing these sequences one can change the being itself.

"CRISPR" (Clustered Regularly Interspaced Short Palindromic Repeats) is a feature of prokaryotic defense system, which alongside a nuclease Cas9 it produces, is used as a genome editing technology.

In order to understand CRISPR, we must know where it came from. It is an acquired immune system of prokaryotes in which bacteria save the DNA of the phages that attack them in their DNA archive. On subsequent attack by that phage , CRISPR produces a special protein called Cas9 (CRISPR associated protein 9) that finds and deactivates the DNA of the virus thus saving the moneran eventually. It can be considered the GPS system of genetic engineering because it is cheap, precise, easy and allows editing in live cells. So what can we expect of this revolutionary method?

CRISPR can be used to treat genetic diseases, viral diseases and even cancer (by making our immune system more efficient cancer hunters).The US and the Chinese government have even approved of gene editing trials on the human body, within the last year. The concept of a "designer" baby can be realized via this technology, since individual genes of the foetus can be controlled. CRISPR can be used to edit the genes of deadly diseases in human embryos thus gradually transforming the whole human genetic pool. This manipulation of genes to cure the disease may give rise to manipulation for a superhuman baby-strongest, most beautiful and most intelligent. Humans have always been concerned about aging. Using CRISPR, we can slow down or even reverse this biological phenomenon by editing genes responsible for aging. Lobster and planarians are some animals immune from aging that can help us in borrowing the genes which make us stay young forever. However all of this is wishful thinking. Research is still underway.

Like all revolutionary scientific researches, this too has some ethical issues. Doubting or banning these technologies would not solve the problems. We need to delve deeper into the pros and cons of CRISPR and then forge on a middle path, acceptable to both science and humanity.

SNIPPET

THE MAP THAT LEADS TO YOU

Do you know how many cells are present in your body? Roughly 37.2 trillion and scientists are out there trying to create a map of all those cells!

This next mega project- the human cell atlas (HCA) will map each cell using data about its size, location, function, and its interactions with other cells. Each cell type will get a unique ID card which will give its three dimensional map, helping us understand how cells work together to form tissues, and how all bodily systems are inter-linked.

Accomplishment of such a mammoth task is made possible by techniques such as CRISPR, and massively-parallel single-cell RNA sequencing (a genomic technique used for identifying individual gene expression profiles of thousands of cells at a time).

Expected result applications:

Comparing cells taken from a healthy person to those suffering from a certain disease will open doors to understanding and perhaps, treating the disease.

Understanding cells at the foundation level will improve drug delivery and dosage systems that exist today. It may even give way to new drugs and their action mechanisms targeted at specific cells.

The map, once complete, will be made public to be used by scientists for research all over the world.

Urja Kalyani, TZH

FACT OR FICTION?

Flying Snakes

Maybe not ‘fly’ but some snakes can glide through the air. In South And Southeast Asia, snakes of the genus *Chrysopelea* contort their bodies in the presence of strong updrafts to glide through the air.

Cloud antelope

It’s bright blue fur and cloudy appearance is just the imagination of the toymakers at CMWyvern.

Goldfishes have poor memory

This is a myth that often circulates, stating that the fsh cannot retain a memory past a few seconds. However,it has been shown that they can remember things as old as a few months!

Blue dragons

Glaucus atlanticus, also called blue dragons, is a species of mollusc, found on the coasts of South Africa, Europe and Australia.

Two faced cat

Frank and louie is the famous two faced cat. Suffered from Diprosopus, a congenital defect also known as craniofacial duplication wherein the organism has a normal body but two faces. Another similar condition is called dicephali, where the organism has two heads. In both cases the organism does not survive long. However, there have been exceptions.

Dinosaur shark with 300 teeth

Chlamydoselachus anguineus, is incredibly simple and unevolved, most likely due to the lack of nutrients found in its deep-sea dwellings. It has been on earth since the time of T-Rex and Triceratops

There’s a sports car in outer space

As absurd ad it may sound, the eccentric billionaires, Elon Musk, thought it was a good idea to send his car, a red TeslaX, as payload, on a rocket (Falcon Heavy) destined to reach the orbit of Mars. Thus, currently the red car is on its way to the Red Planet!

The Starbucks’ strawberry frappuccino has bugs

Well, this one’s a little tricky. Until 2012, Starbucks did use a natural dye called carmine, in its frappuccino, which was made using crushed bodies of *Dactylopius coccus*, an insect. Starbucks has stopped using the dye, however, it is still common in many other food items!

Sitting close to the TV can cause mutations

This would have been true in the days when the television used cathode ray tubes. Back in the day, a certain brand created a batch of television that was defective and did emit dangerous levels of x-rays which could potentially cause mutations. However, all defected pieces were recalled. TVs now a days do not use such technology and are perfectly safe. All they can do is give you some eye strain.

Devil moth

Creatonotos gangis, is a dramatic lepidopteran found in southeast asia. The males gather more attention due to their large, inflatable scent glands which are present to attract a mate.

Bats are blind

This myth started probably because bats use sound waves to locate its prey rather than its sight. Although poorly developed, bats do have functional eyes.

Camels store 30 litres of water in their humps

The camels hump is all fat which is good for it, since it can provide nutrition for several weeks. The camel’s ability to survive weeks without water can be attributed to its varied RBCs, among other adaptations.

ECLIPSED EMOTIONS

Solar Eclipses Confuse Animals

Ankita Saha, FZH

On 21st August 2017, animals at the Nashville Zoo, USA exhibited peculiar behaviour. Flamingos huddled together, the orangutans began climbing the highest heights they had ever climbed, giraffes ran in circles and the rhinos wandered and appeared to be confused. This was recorded on the day the USA witnessed the first total solar eclipse in 99 years to cross coast to coast which covered the skies in darkness from Oregon to South California.

The California Academy of Sciences created the iNaturalist app using which more than 500 people made about 21,000 observations on behavioural changes in animals during the eclipse involving about 350 different species. On an average, there is a solar eclipse on earth every eighteen months, therefore, this was not the first time studies on effects of eclipse on animals was carried out. Back in 1932, the Boston Society of Natural History asked people to send in their observations during a total solar eclipse in New England, people observed that the cicadas fell silent and crickets became chirpy.

Another study in Pinta island in Galapagos, in 1998 found that changes in light levels can affect fish as well.

One of the most astonishing reactions was that of orb-weaving spiders observed in Veracruz, Mexico. Known to dismantle their webs at night, they did so as the eclipse hit the skies.

What causes the animals to show unusual behaviour? Unlike human beings, animals have no means to get news updates, therefore the eclipse comes as a surprise for them and they tend to get confused. Tim Reinbott, director of field operations at the College of Agriculture, University of Missouri observed that the chicken started grooming themselves after leaving their coop which protects them from the heat. This was attributed to the drop in temperature as the air cooled during the eclipse. Also frogs began making sounds and raptors stopped circling possibly due to the change in thermals in Zambia in 2001.

During a solar eclipse, diurnal animals fall silent whereas, the nocturnal animals become more active. They usually perceive the temporary darkness as night time and behave accordingly, which is what happened to the crabs as they came to the edge of the water believing the birds would not spot them. Similarly, the zooplanktons began swimming up the water column to start their feeding routine an hour before the eclipse but quickly returned when the light levels returned to normal.

"It's sort of adorable, this whole colony of tiny little creatures being like, 'Oooh, night time!' and then a few minutes later they're like, 'Oops'.", said Dan Seaton, a solar physicist at the University of Colorado.

So, the next time an eclipse hits your city, grab your eclipse glasses and observe animals.

AN ORB WEAVING SPIDER

SNIPPET

MIRACLE POOP

Faecal Microbiota Transplant (FMT), also known as Faecal Bacteriopathy, is a procedure in which stools of a tested donor are collected and mixed with a saline or other solution. Then it is strained and placed in a patient by colonoscopy, endoscopy, sigmoidoscopy, or enema. It was first documented in 4th century China.

Due to the use of antibiotics, bad bacteria, specifically *Clostridium difficile* over-populates in the colon which causes a condition called *C. difficile colitis* which may lead to fatal diarrhea. The process of faecal transplant aims to replace good gut bacteria that have been killed due to the overgrowth of bad bacteria. It also helps to cure many other digestive or auto-immune diseases, which includes Irritable Bowel Syndrome, Crohn's Disease, and Ulcerative Colitis.

Twinkle Kathuria, FZH

PARASITIC POSSESSION

Urja Kalyani, TZH

Yes, zombies do exist! Well, not the flesh-eating, Hollywood ones, but they are very much a reality. Perhaps the most mind boggling example in the animal world is that of garden snails-*leucochloridium*. These snails are seeminlgy 'possessed' by flatworms named green-banded broodsac which alter snails' natural behaviour. This manipulative parasite uses snails to complete its own life cycle.

The flatworm uses two hosts: passerine bird as a primary host and snail as the secondary. In order to complete its life cycle in the primary host i.e. to lay eggs, it must find a way to enter the bird`s gut. How it does that, you ask? It employs a genius yet evil strategy. The parasite, once inside the snail's body, tells it to let go of its survival instincts, and climb to higher sun lit areas where it is extremely vulnerable (the snails show negative phototropism in general). The parasite reaches into the snail's tentacles and then goes disco-crazy. It starts pulsating inside the tentacles which gives them the appearance of maggots. And what do the birds love to eat the most? Maggots! This clever parasite tricks the bird into eating the snail thinking it to be a delicious juicy maggot. Once inside the bird's gut, the flatworm reproduces and lays eggs which are then excreted out. The snails feed on these bird droppings, hence, starting a new cycle. The green-banded broodsac has other tricks in the box. The parasite engorges the tentacles preventing the snails from retracting them. Weirdly enough, the worm makes the snail infertile, which actually makes sense. The snail uses energy to produce eggs and sperms (being hermaphrodite), but the worm needs all the energy it can get to dance its way to glory. So it sterilises its host to conserve energy.

Fortunately, the snail can regrow its tentacles, regain capability to reproduce and undo the damage on its body once the parasite gets eaten by the bird. This also is a cunning strategy. If the snail survives the infestation, it can be available for another round of the life cycle. I guess, all's well that ends well, right?

GREEN-BANDED BROODSAC WORM

COMPLEXIONED

Urja Kalyani, TZH

Look around, you'll see a plethora of skin colours- black, white and everything in between. Nature always has a purpose. Almost nothing in nature is futile, otherwise it is just a waste of energy. So is the case with skin colour. The difference is perceived because of the pigment, melanin, produced by melanocytes present in the skin. Melanin is a natural sunscreen which exists in 2 forms- phoemelanin, present in freckles of the light coloured people, and eumelanin which is present in dark coloured people. The number and size of melanin particles are responsible for giving the skin its unique colour.

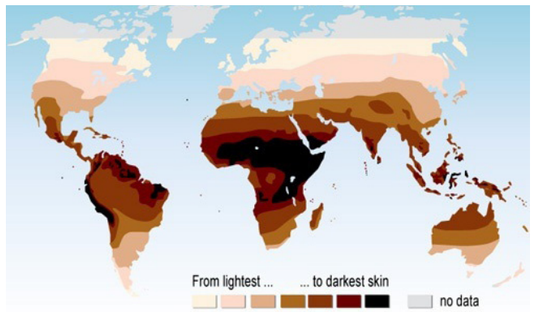
UV exposure plays a central role in skin colour determination. People living in areas exposed to intense UV radiation, tend to have a darker skin colour such as in the tropical regions. Whereas the people living in colder areas with less UV exposure tend to have a light skin colour like in northern regions. This is so because darker skin prevents penetration of UV light and is found to be thicker than light skin because it has faced less photo damage. Interestingly, 'tanning' works on the same principle and the ability to tan renders the skin more adapted to the summers. This happens because UV radiation increases in summers and decreases in winters.

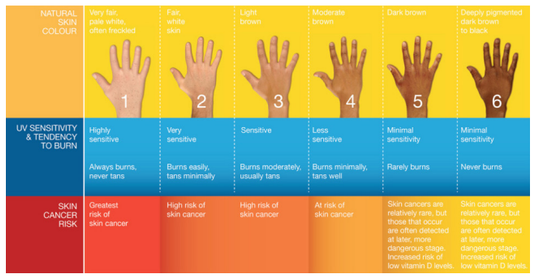
Another factor is vitamin D formation: vital for absorption of calcium and phosphorus from dietary food. 90% of vitamin D is obtained through UV action. Hence, some UV exposure is important for the body.

Skin colour works on a delicate balance between these two factors. People living in areas with less sunlight need lighter skin colour to synthesise as much vitamin D as possible and they can afford to do so because they have lower chances of skin damage due to low UV exposure.

People living in coastal regions such as arctic can have a darker skin , in spite of low UV levels, because they make up for the lost vitamin D through seafood which is rich in vitamin D. Other factors can also modify skin colour such as carotene, blood flow, fat deposits, and dermal collagen. However, new ground-breaking research is bringing all our knowledge into question. A study was done on different groups of African people to find a link between their colour and their genetic makeup. The results were surprising, genes linked from the lightest colour to the darkest colour were found in the African population. Previously, it was believed that our ancestors shed body hair and grew darker skin colour, and that the lighter skin tones evolved as they migrated to the north. However, the researchers propose that these gene variants determining skin colour arose in Africa some one million years ago and spread later to Europe and Asia.

Another important discovery was that our ancestors were moderately coloured than the intense dark hues seen today. This is attributed to two mutations in the gene MFSD12 found in people with darker skin tones. These mutations arose half a million years ago, suggesting that humans before that time were moderately colored.





BIOMIMETICS

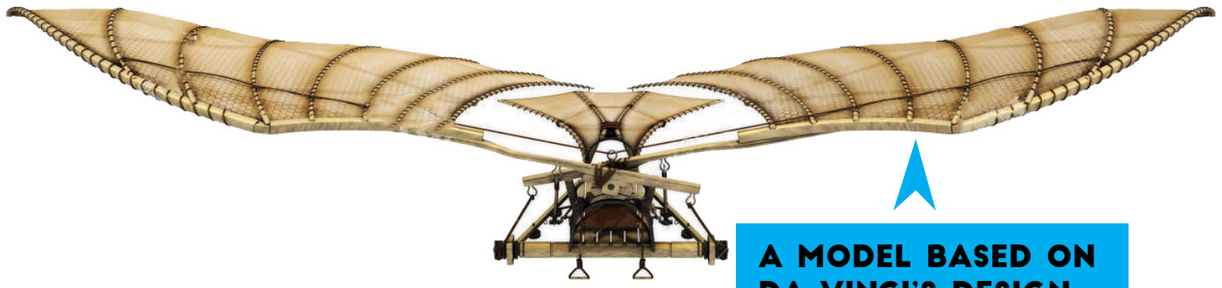
Aparna, TZH

No matter how advanced the mankind gets, it always turns to Mother Nature to solve its problems. Biomimetics is a branch dealing with techniques and procedures inspired by the biological solutions at every scale.

Leonardo Da Vinci was a great observer of the anatomy and flight of birds which inspired him to sketch and write about flying machines. Widely acclaimed Wright Brothers succeeded in flying the first aircraft, heavier than air in 1903 allegedly deriving inspiration from pigeons.

In fact, the front of Japanese bullet train drew inspiration from a kingfisher's beak, so that the sonic boom (when the train exits the tunnels) and air resistance could be reduced while acceleration and energy efficiency are increased. The observation behind this idea was that when Kingfishers dive perpendicular to the surface of the water the splashing of water is minimal. Since it simulated the rounded beak structure of the Kingfisher, the shinkansen also came to be known as the bullet train.

Biomimicry or Biomimetics has the most profound applications in the field of architecture. The 6m tall termite nests in the African grasslands are one such architecture. These nests are built from, soil, tree bark, sand, termite saliva, and yes, they are firmer than concrete! These termites are also capable of maintaining a comparatively lower temperature than outside. Mike Pearce from Zimbabwe noticed these characteristics of termites and constructed Eastgate Centre, the world's first all natural cooling structure in Harare, the capital of Zimbabwe. This building has some holes in the roof and some on the floors allowing the natural ventilation somewhat like the termites. Hot air exits from the roof creating an influx of cold air from the floor. The energy consumption rate of this structure is <10% and an internal temperature of 24°C is maintained even if the outside temperature is higher than 38°C.



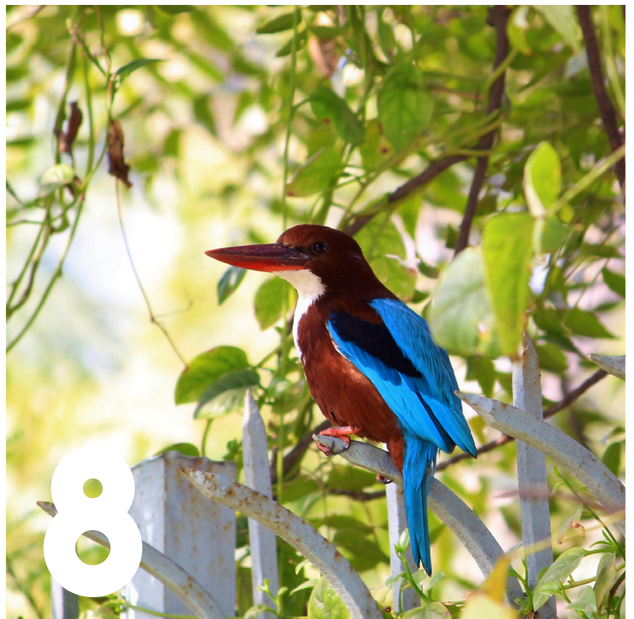
A MODEL BASED ON DA VINCI'S DESIGN

Soon enough we would be able to scale the windows of Burj Khalifa just like in Mission Imposssible. Scientists have developed gloves (to catch space junk) inspired from setae present on the feet of geckos helping them to attach to surfaces.

Globally, Biomimetics is a rising field of future technologies with increasing interests and fundings.

In fact, some companies like Ford, General Electric, Herman Miller, HP, IBM, and Nike are collaborating with scientists by giving them resources to produce and explore novel technologies.

THE FRONT OF JAPANESE BULLET TRAIN IS INSPIRED BY THE KINGFISHER'S BEAK



BIRDLIFE ON CAMPUS

1.PLUM HEADED PARAKEET

2.RED WHISKERED BULBUL

3.JUNGLE BABBLER

4.YELLOW FOOTED GREEN PIGEON

5.BRAHMINY MYNA

6.COPPERSMITH BARBET

7.COMMON MYNA

8.WHITE THROATED KINGFISHER

PHOTOS TAKEN BY

SOUMYA MALLICK, SZH
&
SUKANYA BHUYAN, SZH

CAMERA USED

CANON EOS 700D
18 MP
FOCAL LENGTH: 55-250MM

GLOBAL MELTDOWN

Rise of the Undead

Ananya Banerjee, TZH

ALASKAN PERMAFROST THAWING CAUSING GAPS IN LAND MASS

A 12 years old healthy nomadic boy suddenly contracted Anthrax in the northern region of Russia. A week after his death, his grandmother succumbed to the same disease. The unusual thing about this case is that Alaska –the region where the incident occurred- had been free of Anthrax for the past 75 years! So how is it that an entire herd of reindeers and 20 nomads were infected by a pathogen that was thought to be eliminated?
75 years prior to this incident, the province struggled with the 'Siberian Plague' an infection caused by bacterium *Bacillus anthracis*, commonly known as Anthrax. Russian scientists believe that a reindeer with the same infection died and got buried in the permafrost. Permafrost is a layer of soil or rock that has been in frozen state for more than 2 successive years. The bacterium of Anthrax is known to form spores which stayed in dormant condition under the permafrost until 2016 when a heat wave of 95°F hit Alaska and caused thawing of the frozen soil. The spores moved towards the groundwater and thereby caused an outbreak through consumption.
The entire case brings attention to the fact that permafrost serves as an excellent reservoir for pathogens due to its low temperature, lack of oxygen and sunlight. This isn't the only case of rekindling of infectious pathogens from these soils.

RNA fragments of Spanish flu virus of 1918 have been found from mass graves of Alaska. Also, the DNA fragments of smallpox virus were found in there.
The most troubling fact is that the permafrost might actually be holding strains and pathogens of diseases completely unknown to modern sciences and whose vaccines haven't been develop yet.
NASA in 2005 revived a microbe from Pleistocene period, *Carnobacterium pleistocenium* which was frozen in an Alaskan pond for 32,000 years!
It is not necessary that a heat wave directly melts permafrost. The melting of Arctic sea ice makes Siberian shores contact the sea, which allows expansion of mining and oil drilling industries. However, these industrial practices cause breaking open of the permafrost. NASA for instance, found crystallized microbes as old as 50,000 years inside the Mexican mines.
The March 2017 heat wave in Siberia caused thawing which led to discovery of 7,000 underground methane bubbles that resulted in 1 km long and 282 ft deep crater. Further melting of permafrost will cause release of these gases which will contribute further to global warming and form a vicious loop.
Climate change is preparing to affect us in ways we haven't thought about. An outbreak of a completely new pathogen can potentially wipe off an entire species in an instant. Only measures to reduce the processes leading to global warming can prevent such an event from occurring. Is global warming hinting towards an apocalypse in progress?

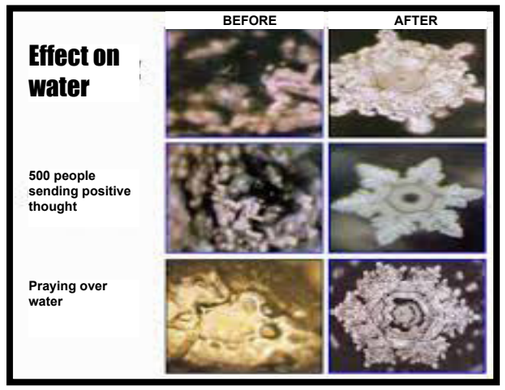
Mrigya Kaushik, TZH

While growing up, adults tried to teach us the importance of good company. They taught us not to cuss or abuse. They even watched what they said around us. And that's what most of us do now, when we are around kids. But have you ever stopped and wondered- why. Why are we so careful to avoid negativity? Is it only the psychological growth that we are worried about, or could negative thoughts/words have a physical implication too?

This is roughly what the researcher and photographer, Mr. Masaru Emoto and his team tried to accomplish. They studied the effect of words, pictures, music and prayers presented to water and observed the shape of the crystals thus formed. The initial idea was to freeze and photograph water crystals from various source. This lead to a conclusion that the anthropologically untouched water had more beautifully and regularly shaped crystals, while the water from urban towns had more irregular and shapeless crystals.

Further when they observed crystals after the water had been cursed or blessed, results were pretty obvious. The water that had been exposed to positive words or music or prayers, had visibly more pleasing crystals than the water that was exposed to negative words or harsh music. The water used in both cases was hospital grade double distilled water, thus it was as pure as it can be. You don't have to take my word to believe the 'beauty of the crystals'. See for yourself and judge.

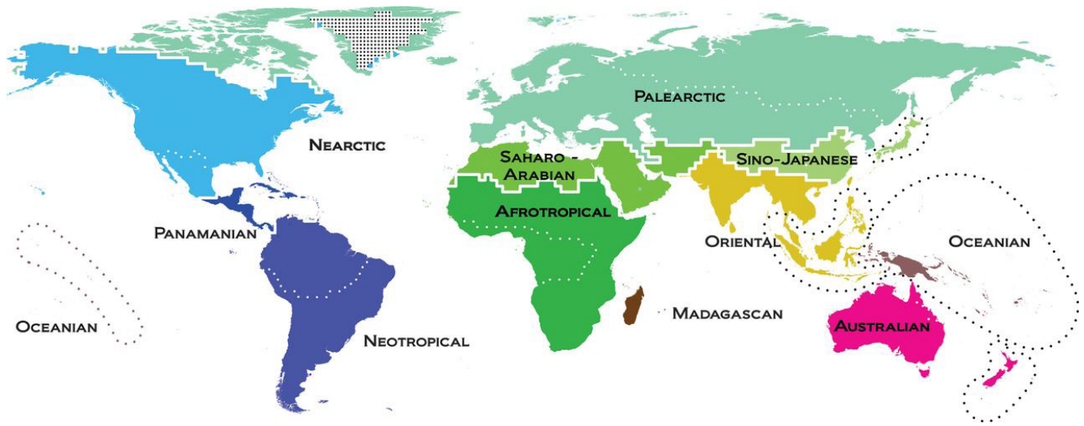
What causes this change in shape of the crystals is not absolutely clear so far. But what is clear is that words and music have some drastic physical effect on water. When you think about it, if the effect is so conspicuous on microscopic level, what could it do on macroscopic levels! If that is the case, maybe we should all have a sip of the holy water and listen to Mozart's symphonies. You and I are 70% water. Imagine what physical implications it could have on our bodies. This research has raised more questions than it has answered! Nature works in mysterious ways, and there's a long way to go before we uncover these mysteries.



Retracing Boundaries

Ananya Banerjee, TZH

Alfred Russel Wallace in 1876 became the first person to present a global map of distribution of animals. This major tool of zoogeography divided the world into six terrestrial units positioned so due to continental plates. Being used for over 150 years there was a need for renewal of this map to meet the data of modern times.
While Wallace made use of only distribution of animals as a parameter, a group of scientists from the University of Copenhagen devised an upgradation of the map, positioning the realms by coalescing data of geographical distribution and phylogenetic relationship of 21,037 species of amphibians, birds and mammals. The phylogenecity was measured by beta diversity(pβ) i.e. the ratio of regional and local species diversity in an area.
The following conclusions were drawn from the study:
1. The map divides the world into 20 zoogeographical regions comprised under 11 larger realms.
2. Beta diversity established uniqueness of regions. The most phylogenetically distinct areas were found to be Australian(mean pβ= 0.68), Madagascan(mean pβ= 0.63) and South American(mean pβ= 0.61) in terms of vertebrate population.
3. The new map states that Palearctic realm extends to Western Hemisphere wherein East and Central Siberia are phylogenetically more similar to Nearctic realm than Palearctic.
4. Also the newly introduced realms are Panamian, Sino-Japanese and Oceania.
5. Wallace's line is present between Borneo and Sulawesi separating Asia and Australia. However, taxa analysis of the new study shows the boundary corresponding more with Weber's hypothesis which placed it east of Sulawesi thereby now separating Oriental and Oceania realms. For birds Wallace line still holds true.
6. Overall vertebrate spatial turnover is higher in Southern hemisphere than Northern. Northern hemisphere's lower turnover is probably due to presence of non-glacial tundra and high degree of connectivity between regions.
Currently more data is being compiled to form a similar map summarising the reptilian distribution. These maps give a novel outlook for comparative studies of ecology, conservation and adaptive behaviour in vertebrates across the globe.



UPDATED REALMS

A NEW PLANET SYSTEM LIKE OURS

Aparna, TZH

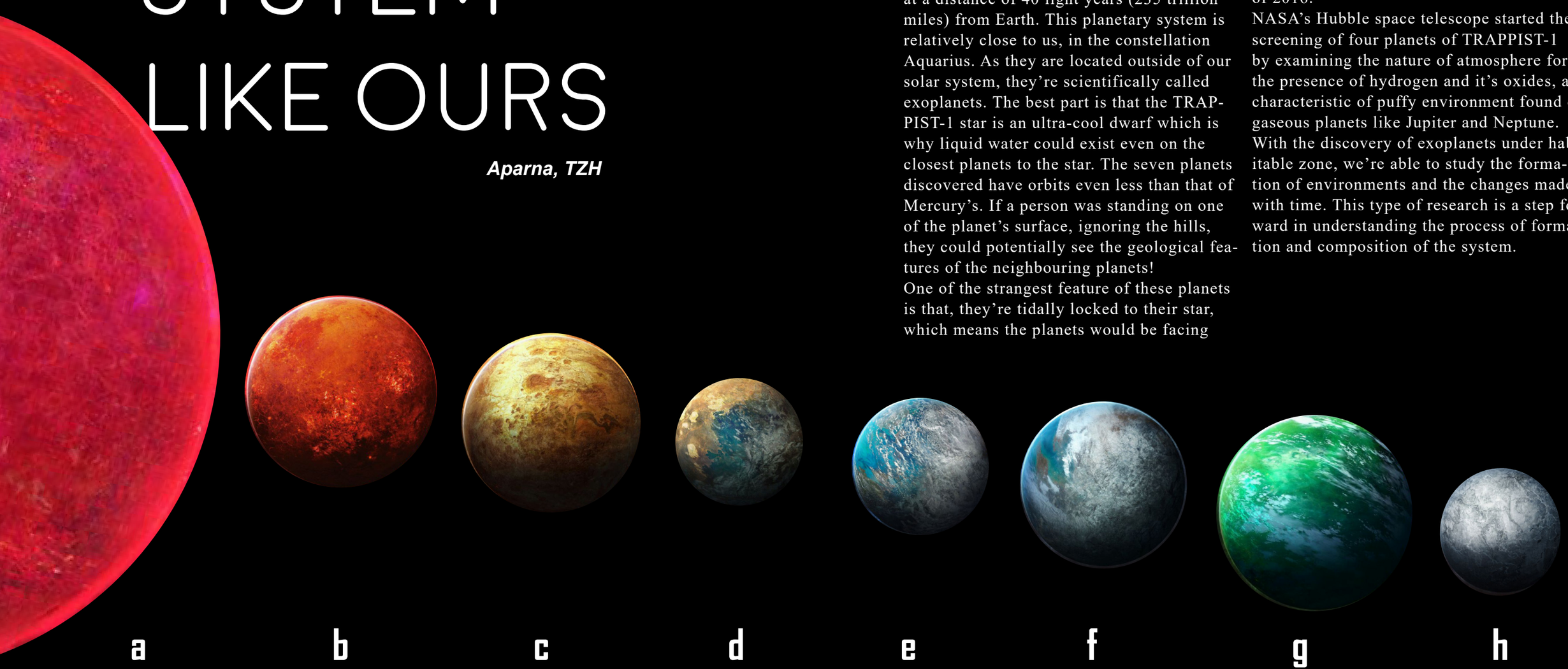
With all our endeavour and will, we've finally discovered the particulars of starting a life! Yes, the Spitzer space telescope has recently discovered the first known system of seven earth-sized planets around a single star.

This system is named TRAPPIST-1 - The Transiting Planets and Planetesimals Small Telescope. Among these seven planets, three are found in the habitable zone which is the greatest number around a single star, just like our solar system. This planet system is at a distance of 40 light years (235 trillion miles) from Earth. This planetary system is relatively close to us, in the constellation Aquarius. As they are located outside of our solar system, they're scientifically called exoplanets. The best part is that the TRAPPIST-1 star is an ultra-cool dwarf which is why liquid water could exist even on the closest planets to the star. The seven planets discovered have orbits even less than that of Mercury's. If a person was standing on one of the planet's surface, ignoring the hills, they could potentially see the geological features of the neighbouring planets!

One of the strangest feature of these planets is that, they're tidally locked to their star, which means the planets would be facing their same side to the star. Hence, there's either day or night to a particular side of the planet. This results in some of the most dramatic effects on the climate such as strong winds blowing from day to the night side constantly.

The Spitzer is an infrared telescope, well suited for examining celestial bodies emitting waves with wavelengths longer than what a normal human eye can detect. Hence, the Spitzer was made to observe TRAPPIST-1 for continuous 500 hours in the fall of 2016.

NASA's Hubble space telescope started the screening of four planets of TRAPPIST-1 by examining the nature of atmosphere for the presence of hydrogen and it's oxides, a characteristic of puffy environment found on gaseous planets like Jupiter and Neptune. With the discovery of exoplanets under habitable zone, we're able to study the formation of environments and the changes made with time. This type of research is a step forward in understanding the process of formation and composition of the system.



INHERITING ADDICTION

"And they say
She's in the Class A Team
Stuck in her daydream
Been this way since 18
But lately, her face seems
Slowly sinking, wasting
Crumbling like pastries"

Sukanya Bhuyan, SZH

These lines from the iconic song 'A team' by Ed Sheeran reflect what life is like for an addict stuck in a loop of cocaine, meth and other 'Class A' drugs.

Addiction is a chronic relapsing psychiatric disorder characterized by the compulsive and dyscontrolled use of a drug or activity, with maladaptive and destructive outcomes. Researchers have found that addiction is a disease with a genetic predisposition.

When we talk about an "addiction gene", it doesn't mean that a person born with a particular gene will become an addict, because addiction depends 50% on an individual's environmental factors, their personal choices and coping skills as well. However, that person might be more susceptible to addiction. For example, the individuals who inherit fewer dopamine receptors, with the A1 allele of the dopamine receptor gene DRD2, are more likely to be addicted to alcohol or cocaine. Also, multiple genes are responsible for addiction and not every addict will have the same genes as they vary for different substances. Recent experiments in mice have shown that a non-functional copy of a specific gene called CSNK1E (casein kinase 1-epsilon) renders an individual more sensitive to the effects of opioids and to the rewarding property of the drug as well. Since mice are typically accurate predictors of humans' addiction liabilities to different drugs, it suggests that polymorphism in this gene may enhance susceptibility to the euphoric, addictive properties of opioids.

In 2015, it was discovered that methamphetamine (commonly known as meth or crystal meth) addiction is linked to two protein coding genes in a region of Chromosome 11-Hnrnph1 (heterogeneous nuclear ribonucleoprotein, H1) and Rufy1 (RUN and FYVE domain-containing 1). It is possible that these genes could increase one's susceptibility to developing tolerance, affect one's withdrawal symptoms and make it more difficult to quit and easier to relapse.

TAAR 1 (Trace amine associated receptor 1) knockout mice (the gene coding for TAAR 1 is inactivated) demonstrate increased sensitivity to dopaminergic activation while TAAR 1 agonists reduce the neurochemical effects of cocaine and amphetamines, attenuate abuse- and addiction-related behavioral effects of cocaine and methamphetamine.

While an addict might have taken the first step towards a wrong path, it is actually their environment and genetic predisposition that locks them up in this loop. Understanding the genetic basis of addiction genes will ultimately help in the prevention and treatment of addiction and the subsequent rehabilitation of addicts.

DISASTROUS DRUGS

Anushka Saxena, FZH

While scrambling across the google alerts on my phone, I stumbled upon Chloe Anne's blog. A girl just my age but had problems and strength much beyond her years.

"Every day is a battle against the never-ending symptoms, against the pain, against the agony when medicines, feed and water is pushed down my throat. Then there's the war with the invisible aspects people don't see: the nausea, migraines and the intense chronic pain that you don't always see in public because of the 'stay brave and cry later face'."

This is an excerpt from her blog. Chloe is a victim of ineffective HPV (Human Polio Virus) vaccine. Upon further reading, I found out that she was not the only one. Millions of people all around the world have been victims of these disastrous "clinically approved drugs". In today's modern age and era, we are surrounded by drugs everywhere. Research and technological developments have revolutionised the field of medicine and allelopathy. Millions of drugs today are being synthesized and lined up for clinical trials and after being given the green flag of approval, they are further processed to the next step: Commercialisation and distribution to the mass.

However some of these miracle drugs flashed a big red danger sign when distributed to the mass. Recent example includes the dengvaxia vaccine. This vaccine was introduced by the Brazilian government in an 11-licence step programme to protect the children of the country from terrors of dengue, but this proved to be an adverse step. It consumed the lives of 20 children and put many others at risk. Almost two weeks later, the Philippines Department of Health halted the use of Dengvaxia "due to evidence that it could worsen the disease".

There have been many other drugs that had such disastrous effects that they had to be recalled from the market. Such as the cholesterol reduction drug, Baycol, that lead to kidney failure; Cylert, an ADHD drug led to liver toxicity; a synthetic oestrogen, DES(diethylstibesterol), which was supposed to prevent miscarriages, caused birth defects and lead to an increase in pregnancy complications; Pallodone, a narcotic painkiller that could slow or stop breathing, or cause coma or death! The list goes on. There is no specific causative agent that can be isolated and blamed for such "mistakes". Contributory factors reported for these pandemics are negligence of the government or of the approving committees, corruption as well as lack of complete knowledge on the effect and extent of these drugs.

Every problem has a solution and so does this one.

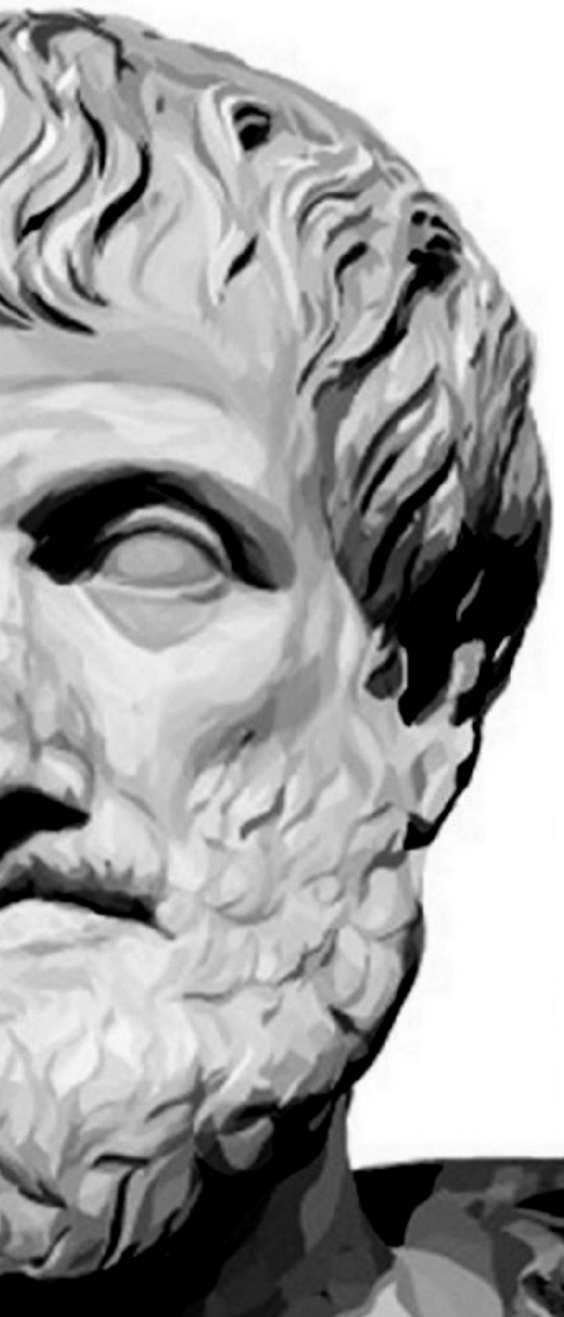
1. Various screening committees can be appointed before mass distribution of these drugs.
2. Labs must perform complete and proper research regarding safety and detrimental effects of the drugs.
3. Also, public must be properly educated regarding every aspect of the trial and drug.

Chloe wanted to be a dancer and now she is paralysed, lying on her bed, staring out the window and wondering what if...

THE MIND, MANIA AND MORE

Harshita Rupani, SZH

"NO GREAT GENIUS HAS EVER EXISTED WITHOUT A STRAIN OF MADNESS."
~. ARISTOTLE

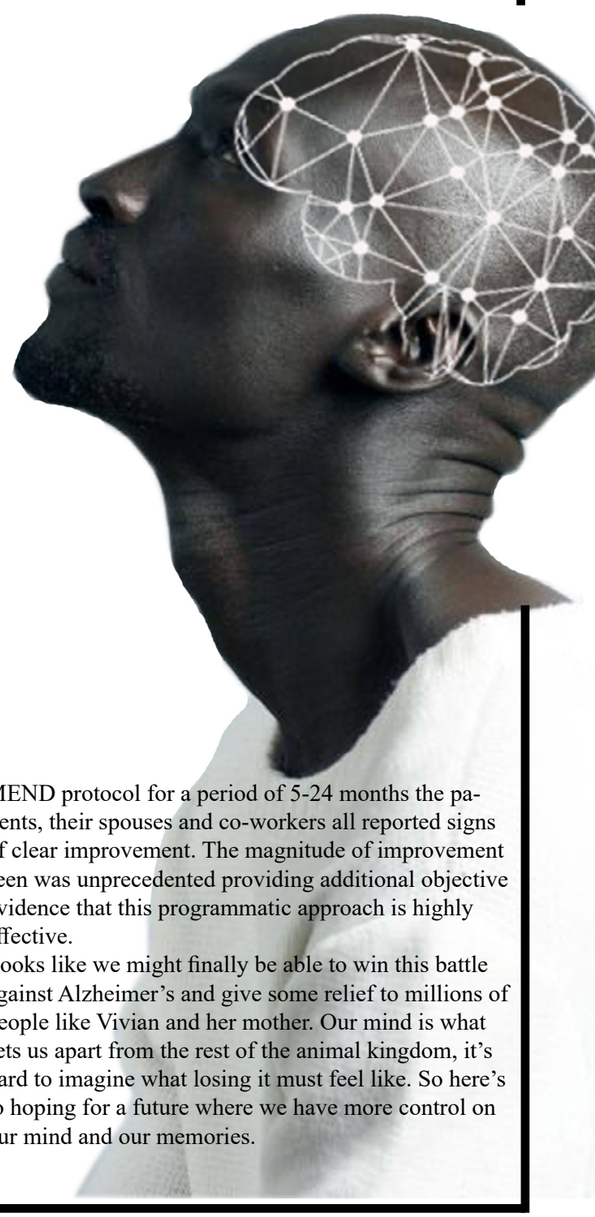


History is marked memorable by the presence of amazing artists like Beethoven, Vincent van Gogh, Sylvia Plath and John Nash and many others. All their work is highly varied but the thing they have in common, is that they all suffered with mental illness in their lifetime. Such famously known observations made the link between mental affliction and creativity seem very obvious to the common man. However several studies conducted on the same seem to differ
The link is examined by two approaches. The first is by conducting interviews or analyzing works of prominent artists. Lange-Eichbaum's study of 1931 was the first to delve into this link. It interviewed over 800 renowned geniuses, majority of whom had reported mental health issues. Contrastingly Albert Rothenberg interviewed 45 Nobel laureates and found no significant association between creativity and psychiatric disorders. Rothenberg also stated that the criteria for being creative is not very clear, since working in science, art or literature, does not prove a person is creative. Also people with mental illness try to work in creative jobs not because they are good at it but because they're attracted to it.
The other approach is to observe creativity amongst the mentally ill. Studies show that those who are highly creative run at a higher risk of depression, schizophrenia, and bipolar disorder but the data is fragile. In a report of 1.2 million Swedish people by Simon Kyaga found that with the exception of bi-polar disorder, those in scientific and artistic professions were contrastingly not more likely to undergo mental disorders. However it was strikingly revealed that the siblings and first-degree relatives of patients with mental disorders were overrepresented in creative professions. Relatives were believed to inherit a dilute version of the mental illness that encouraged creativity!
So far a definitive connection hasn't been established due to methodological and conceptual inadequacies. Perhaps the link between mental illness and creativity endures purely because we want it to since it opens a horizon of possibilities for the mentally ill. However, until credible scientific proof, the link is merely a mirage created for our own satisfaction.

ALLAYING ALZHEIMER'S

Anushka Saxena, SZH

"Think of my mom when you remember the good times you had and still laugh at the funny thing you did. Cherish the fact that your mother wakes you up every day and gives you a morning kiss. Hug her and tell her that you love her every day. My mother died a few days ago but to me, she was already gone."
This was Vivian, a native from Tennessee who gave this moving eulogy at her mother's funeral, a lady who bravely battled the crippling disease of Alzheimer's for 10 years before finally giving in. Alzheimer's disease simply referred to as AD is a chronic neurodegenerative disease that advances slowly from early stages of mild memory loss to the painful later stages of language problems, disorientation, mood swings, loss of bodily functions and ultimately death. This degenerative disease has become a cause of concern for the world as a recent study indicates that about 0.40% of the world population was afflicted by AD and that the prevalence rate would triple or possibly quadruple by 2050.Alarming figures indicates that this disease has become the third leading cause of death in the United States and the UK alone. Let's face it, we are on the losing side of this aggressive ailment. But 'losing' is not a word that mankind likes. Scientists all around the world have taken the burdensome task of defeating this vicious disease. Recently, the scientists at MIT had their eureka moment when they discovered the process of blocking a key enzyme that may reverse memory loss. Their trials conducted on lab rats showed that memory losses in mice were reversed after interfering with the enzyme known as HDAC2 that turns genes off by condensing them so tightly that they can't be expressed. For this they engineered neurons to overproduce a fragment of HDAC2 protein that binds to Sp3 gene and found that the fragment sopped up most of the available SP3, blocking it from binding to HDAC2 and releasing the blockage of memory linked genes. Another feat in this direction was made by the team of Dale E. Bredesen by using a therapeutic approach that was both programmatic and personalized rather than mono-therapeutic and invariant and was dubbed as metabolic enhancement for neuro-degeneration (MEND).This study was done on a group of 10 patients who had to discontinue or were struggling at work. After their treatment with the



MEND protocol for a period of 5-24 months the patients, their spouses and co-workers all reported signs of clear improvement. The magnitude of improvement seen was unprecedented providing additional objective evidence that this programmatic approach is highly effective.
Looks like we might finally be able to win this battle against Alzheimer's and give some relief to millions of people like Vivian and her mother. Our mind is what sets us apart from the rest of the animal kingdom, it's hard to imagine what losing it must feel like. So here's to hoping for a future where we have more control on our mind and our memories.

WISHING FAREWELL TO RAMAA MA'AM

Teaching is not only imparting academic knowledge to students. Teaching is a job with a hundred hidden duties. Duties that often go unnoticed and unappreciated. A good teacher works on a student's wholesome growth. A teacher acts as a mentor when you need someone to guide you, as a friend when you want someone to share a smile with, as an adult when you are acting like a baby and above all, dragging you back on track if you begin to wander on the wrong path. This basically sums up the persona of Mrs. Ramaa Sinha.
Ramaa ma'am, with her stock of knowledge and her way of beautifully weaving a concept into a story, is a lovely company to everyone around. However, do not let her charming smile fool you into thinking that she's lenient. When it comes to educating a student, she means business. She does not, at any cost, compromise in her methods of teaching which is highly admirable. She does not only share knowledge with her students, but also drills into them, qualities like discipline and punctuality.
Her personality is envious and her aura demands respect.
It will be difficult to say goodbye to such a righteous personality. Perhaps, all good things must come to an end. So does Mrs. Ramaa's tenure. We are saddened at the thought of her leaving us, but also glad to have known her.
We thank her, for being a mentor, a friend and an amazing teacher to thousands of students.

A WORD FROM HER STUDENTS

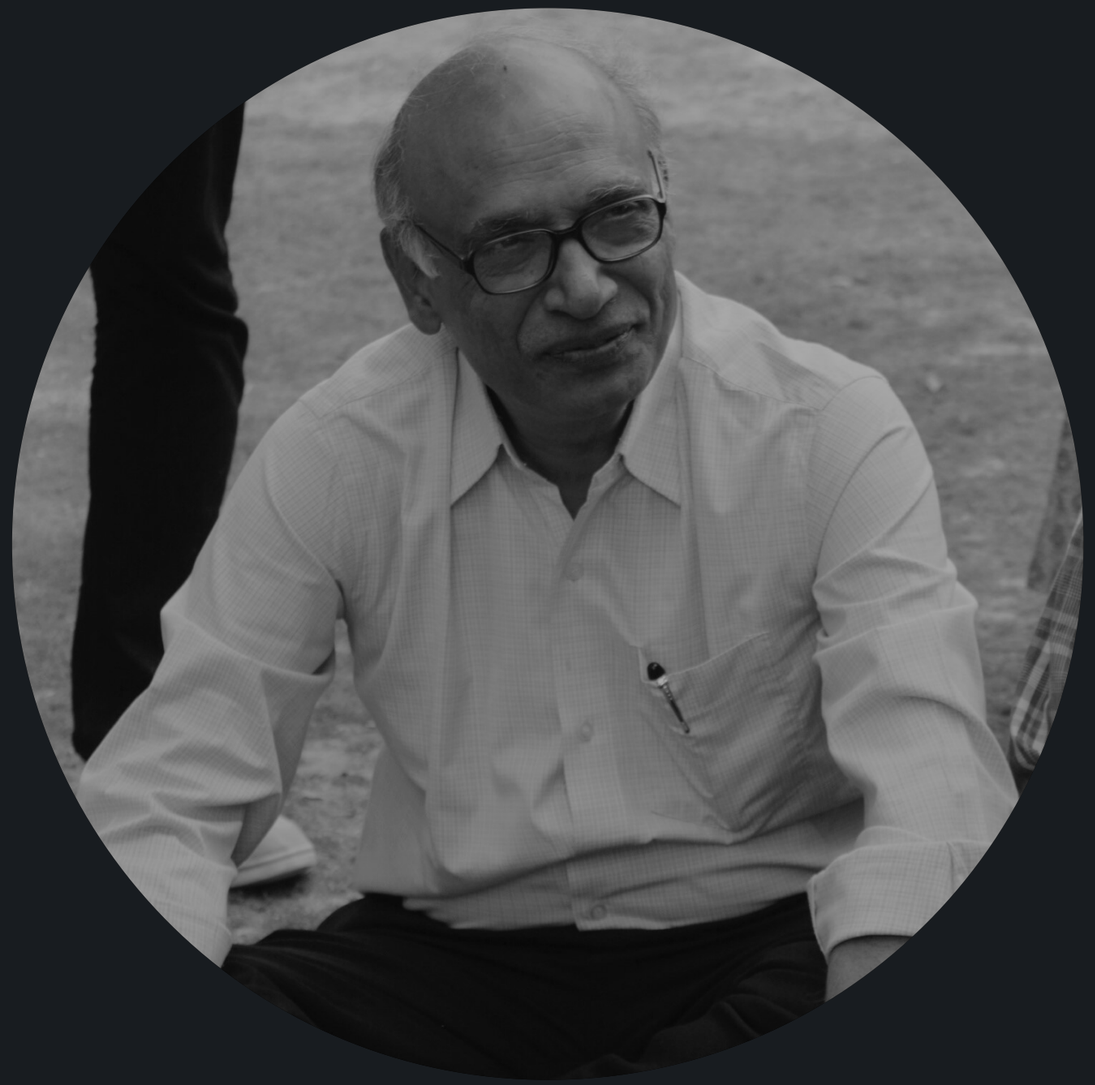
"Ramaa Ma'am, who gives us a picture of THE LADY DARWIN in our minds is one of the best teacher that a zoology student can have. Inspiring students by her punctuality, also enlightens each & every student with her ever lively warm smile. Master in her subject Developmental biology, she knows the tricks of making any chore very simple & perfect. She is a human being with an ocean of knowledge & believes in not just teaching but building a strong foundation for one's life.

Ma'am we thank you for being such a good mentor in this phase of our life. Ma'am we are grateful to you for being such a wonderful teacher of all times. Thank you Ma'am"
~Mandeep Gulati, Batch 2016

"Her didactic and edifying methods of teaching are hard to forget. She is a teacher who puts her full effort towards making sure her students not only score but also learn and fully understand every topic and every line that she teaches. Her dedication is truly inspirational. Her advices and everything she has taught us will definitely stay with us forever."
~ Anwesha Mukhopadhyay, Batch of 2017

Mrs. Ramaa Sinha is the living embodiment of the word diligence. Her classes were ones filled with years of experience and knowledge, each topic was thoroughly covered and no doubt left unanswered. The other students and I would sometimes leave her classes at the later hours of the day so saturated with the information that was generously handed down by her but for the earnest ear and the observant eye those classes were a goldmine of insight into the topics that were being covered. Her notes written with microscopic attention to detail are something I still cherish to date. A professor whose lessons taught will forever be embedded in my heart, her teaching etched in my mind.Wishing ma'am a long and prosperous retirement on behalf of the batch of 2017.
~Ajn Vats, Batch of 2017

REMINISCING IN THE MEMORY OF RAO SIR



Since teaching is a noble professional, Dr VVSN Rao was the noblest of men. His teaching did not aim at the students achieving marks in exams. Rather, he focused on imparting knowledge to his students and making sure that it stuck in their heads. He like all other professors here, had a myriad of knowledge. However, what made him unique, was the zeal to impart that wisdom. He had been teaching for forty years, however these years had not waned his enthusiasm. He had a vitality about him, even in last of his teaching days.

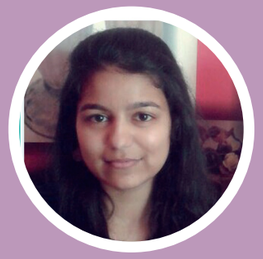
Dr. Rao was supposed to retire in 2017, which he did. However, the retirement party was slightly different than anticipated. Somewhere in the early months of 2017, Dr. Rao was diagnosed with lung cancer, which was unfortunately in its final stage. Even though he was battling such a vicious ailment, it did not affect his vigour and his passion for teaching. Even a couple of weeks before his death, he was genuinely concerned about who was going to teach the subjects that he usually took and how it could be made easier for the students. Dr. Rao was an amazing teacher. He had his retirement party in the hospital ward surrounded by familiar smiling faces that masked a melancholy within. The room was full of warm hearts and the cold hospital trays. Everyone had happy tears, to have met such a man in their lives and sad smiles to be losing him, forever.

Dr. Rao departed this earth in August 2017.But he still resides in the hearts of the thousands of students who learned from him and the professors who are inspired by him.

LIFE AT GLANCE

IN THE DEPARTMENT OF ZOOLOGY

RANK HOLDERS



Deeksha

1st

Vishakha Dhapola

2nd

Rinshu

3rd

THIRD YEAR

Ananya Banerjee

1st

Urja Kalyani

2nd

Saiyami Bhardwaj

2nd

Yukti Taneja

3rd

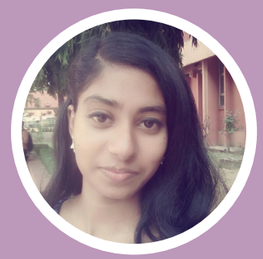
SECOND YEAR

Kanishka Baisoya

1st

Riya

2nd



Wasima Sultana

3rd

FIRST YEAR

ECA ACHIEVERS

Harshita Rupani, FZH

Member of Verbum

Nikita Golaya, SZH

Member of Effulgence
Member of Verbum

Sahil Mota, SZH

Member of Anubhuti

Vivek Kumar, TZH

Captain of the Volleyball Team

Shriya Bhattacharya, FZH

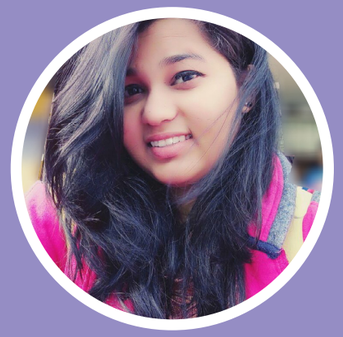
Member of the Badminton Team

Saksham Sethia, FZH

Member of Verbum

Shikha Mohini, SZH

Member of Enactus



Shraddha Pandey, FZH

Member of Nrityangan

Aastha Saini, FZH

Member of Leonci

Apoorva Sodhi, SZH

Treasurer of Nritya

A. Tharanirakshita, SZH

Member of Alaap

Soumya Mallick, SZH

Member of Parivartan

Sukanya Bhuyan, SZH

Member of Parivartan

Swostik Preetam, SZH

Member of Parivartan

REASEARCH AT THE DEPARTMENT OF ZOOLOGY, SVC

The Department of Zoology has been active in the field of scientific research. The faculty manages to take out valuable time and do quality research apart from their teaching hours. Many teachers have managed to bag several publications without compromising on their teaching responsibilities. Interestingly, the students have been actively involved in research along with the professors. In 2016, our Department had five Innovation Projects, and in total 8 Research papers and 10 book chapters. Some of the recent achievements of 2017 are mentioned here.

AWARDS:

Dr. Mansi Verma was the recipient of Young Scientist Award in Molecular Microbiology And Biotechnology by Association of Microbiologists of India (AMI) for the year 2017 during 58th Annual Conference Of AMI.
Dr. Mansi Verma and **Dr. P. Jayaraj** were also awarded for their best oral presenters in Innovative Sciences at INSCR International Conference on role of Microbe Plant Animal Interactions in human Health, held in September 2017.

PUBLICATIONS:

Dr. Vartika Mathur has published a chapter titled, " World Cultivation of Genetically Modified Crops: Opportunities and Risks" published in the book, "Lichtfouse E. (ed) Sustainable Agriculture Reviews", Springer International Publishing, in 2017.

Dr. Om Prakash has just got a paper accepted in the journal, Fish and Shellfish Immunology on the 4th of March 2018, titled- "Leucaena leucocephala pod seed protein as an alternate to animal protein in fish feed and evaluation of its role to fight against infection caused by Vibrio harveyi and Pseudomonas aeruginosa".

Dr. P. Jayaraj has two papers published in the last academic year. One with **Dr. P. S. Dhanaraj,** titled - "Immunohistochemical expression of X-linked inhibitor of apoptosis in eyelid sebaceous gland carcinoma predicts a worse prognosis", published in 2017 in the International Journal of Ophthalmology. The other, more recent publication, with **Dr. Anita Verma** and **Dr. Rajendra Phartyal**, was in February 2018, in the British Journal of Ophthalmology, titled- "Immunohistochemical evaluation of stress-responsive protein sestrin2 and its correlation with p53 mutational status in eyelid sebaceous gland carcinoma".

Dr. Richa Misra has published a paper, titled, "Gut microbiome contributes to impairment of immunity in pulmonary tuberculosis patients by alteration of butyrate and propionate producers" published in January 2018 in the Environmental Microbiology.

WORKSHOPS ORGANIZED BY OUR DEPARTMENT:

Dr. P. Jayaraj (Coordinator, Department of Zoology) along with **Dr. Rajendra Phartyal, Dr. Riyaz Bakshi, Dr. Manoj Jaiswal, Dr. Bronson** and **Dr. Mansi Verma**
organized a two-day workshop on Advanced Science and Mathematics for Senior secondary students from 7th-8th April 2017.
Dr. P. S. Dhanaraj (Convenor) and **Dr. Mansi Verma** (Co-convenor) along with other faculty members of department organized a two-day workshop on "Molecular Characterization of Human Samples To Identify Disease Risk Loci" during 7th-8th April, 2017.
Dr. Vartika Mathur (convener) alongside **Dr. Anita Verma** organised a Faculty Development Programme on Wildlife Conservation and Management for the professors of University of Delhi on 19th February, 2018.

GRANTS/CONSULTANCY PROJECTS

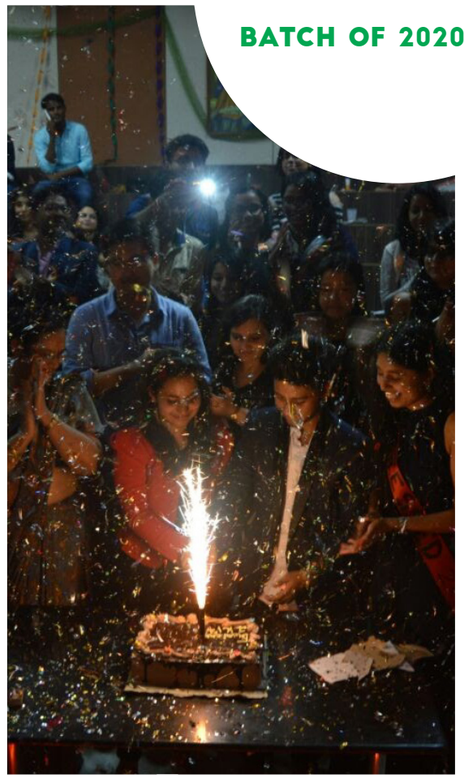
Dr. Vartika Mathur has multiple research grants including Study on isolation, enumeration and identification of bacteria from the indoor air conditioning system". Funded by M/S Eureka Forbes Pvt. Ltd.; "Evaluation of PISOM, a plant growth regulator for agricultural crops". Funded by PI Industries Ltd.; Fortification of Indian mustard by growth promoting bacteria through priming" Start-up research grant for Young Scientists by SERB, DST.

FAREWELL 2017

BATCH OF 2017

FRESHERS 2017

BATCH OF 2020



HIGHLIGHTS 2017 -2018

The Zoological society has proudly organised many successful series of lectures and event every year. The year 2017-18 followed the same suit.

Dr. Pankaj Seth from NBRC, New Delhi delivered a highly factual and interesting lecture on "NeuroAids". The lecture made everyone aware about this version of AIDS and guided the audience through different research aspects in the field.
A Health Camp was organised in collaboration with Fortis Hospital, as a means of increasing awareness amongst people about health and wellbeing. The camp saw enthusiastic participation by other fellow departments as well.
The Fifth Edition of the annual magazine 'Phoenix' was released by Dr. Pankaj Seth. Encompassing latest advancements in the scientific field and informative articles from varied disciplines such as Physiology, Immunology, Environment etc.
As a creative and productive activity a workshop on 'Bird Nest making' was organised by Eco Roots foundation of India. The workshop taught the audience about artificial nests and how to build them from scratch using jute cloth, straws and rings.
An event thoroughly enjoyed by teachers and students alike was the interactive outdoor game 'Organ-O-War' conducted by the students of the zoology society. This included multiple games -brain games and physical games- being played in a relay format.
2018 saw an interesting lecture titled "How to make a Drug" by Dr. Jasminder Sahi, Senior director at Sanofi, China. The lecture aided students in understanding the various procedures utilised in biotechnology and Dr Sahi guided many of us through our scientific enquiries.

MAD'17

Evolvere, the zoological society of Sri Venkateswara College as a part of its annual event organised MAD 2017 with an objective to draw attention towards one of the most ignored yet important aspect of our life: Mental health.
The event was organised on 24 October 2017 and began with the lighting of lamp and evoking the blessings of Lord Venkateswara. The event kicked off with an inspiring talk by Dr Nand Kumar, Professor, Department of Psychiatry, AIIMS which centralised the importance of mental health and how its well being is necessary for the normal sustenance of life. Further along, we had an informative session on Autism by Dr Raman Sippy which provided us with a new insight on mental health, whilst changing the outlook of students and faculty alike. The event continued with an interactive session by The Sanjivini Society for Mental Health, a non-profit organisation that provides free and confidential counselling to those in the face of mental distress. They taught us that we are not alone and always have someone to talk to and help us through our problems. Finally, the event concluded with a workshop on 'Expressive Arts and Movement' by Ms.Pavithra Chari, a freelance therapist who made us realise that at the end of the day, whether you are an eighteen years old student or a sixty years old professor, what we all need to remember is to let loose every once in a while, to forget the barriers of the society and to take care of ourselves first.
By the end of the day the success of the entire event could be deduced from all the chuckling, smiling and less stressed faces.

FEB
2018

Travel Tales

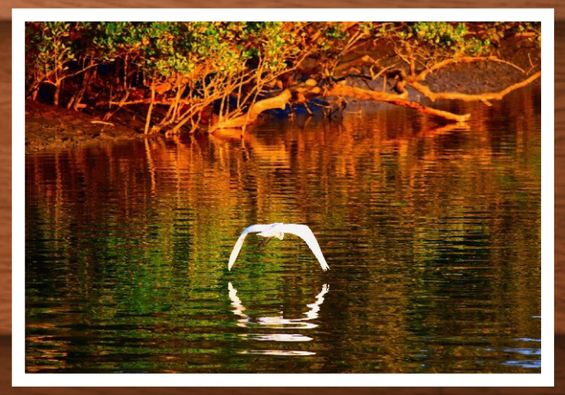
Some moments captured from the memorable trips to Mussoorie, Rajasthan and Sultanpur National Park

creative corner

Soham Majumdar, TZH

Soumya Mallick, SZH

Aparna, TZH



Apoorva Sodhi, SZH

Ankita Saha, FZH

Soumya Mallick, SZH

Sukanya Bhuyan, SZH

Swostik Preetam, SZH

Creative Corner

Ankita Saha, FZH

Dr. Mansi Verma

Soumya Mallick, SZH

Swostik Preetam, SZH

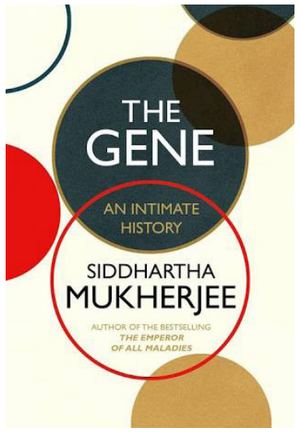
Khushboo Kumari, JZH

Himanshu, JZH

Yukti Janeja, JZH

Rohit Kumar, JZH

READER'S DELIGHT



1) The Gene: An Intimate History (2016)

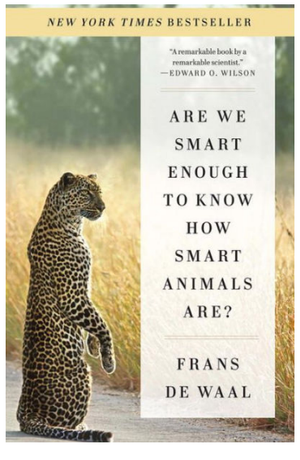
Book by Siddhartha Mukherjee

"Mukherjee contends that while genetic theories have provided crucial medical insights, they have also fueled the depraved thinking that reached its nadir in eugenics."
~ The Washington Post

2)The Sting of the Wild (2016)

Book by Justin O. Schmidt

"[Schmidt's] low-down on sting biochemistry and physiology is relentlessly zestful, even as he recounts the swelling, burning consequences of his curiosity."
~ Nature



3) Are We Smart Enough to Know How Smart Animals Are? (2016)

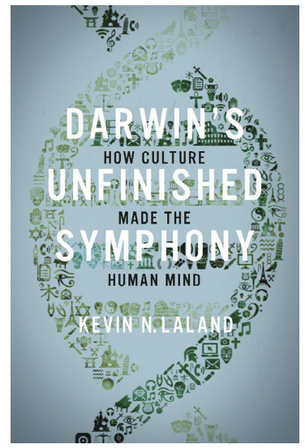
Book by Frans de Waal

"In his book, de Waal delves into research illuminating the intelligence not only of primates but also of birds, elephants, dolphins and whales."
~ The Washington Post

4) Bring Back the King: The New Science of De-extinction (2017)

Book by Helen Pilcher

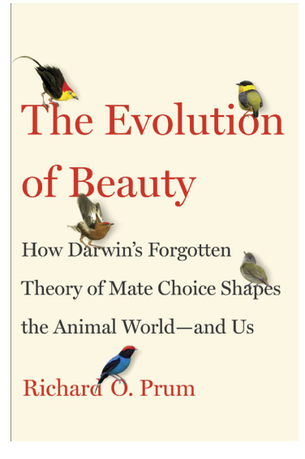
"Pilcher's wit shines through ... You will be left with a newfound respect for conservationists' hands-on methods of preserving genetic material."
~ Sunday Times



5) Darwin's Unfinished Symphony: How Culture Made the Human Mind (2017)

Book by Kevin Laland

"Kevin Laland's wonderful book explores the evolutionary origins of human culture. He argues that what separates us from the rest of the animal kingdom is our particular talent for precisely imitating others, coupled with our ability to transfer potentially huge amounts of information across time and space."
~University of Cambridge



6) The Evolution of Beauty: How Darwin's Forgotten Theory of Mate Choice Shapes the Animal World and Us (2017)

Book by Richard Prum

"Prum's argument is exhilarating. Any biologist could read this book and not walk away at least questioning the idea that adaptation must explain every last trait. Survival of the fittest might not be enough to explain nature. We might need survival of the prettiest, too."
~ Wall Street Journal

EVOLVERE

PHOENIX

THE ANIMAL KINGDOM GOES BEYOND THE HUMAN IMAGINATION