



EVOLVERE PRESENTS

# PHOENIX

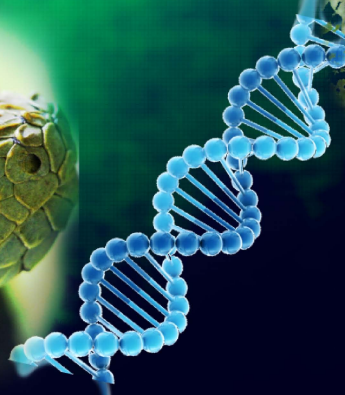
SECOND EDITION

2014



The obsession with putting ourselves  
at the centre of everything is the  
bane not only of theologians but also  
of zoologists.

- 'Life of Pi', Yann Martel



Department of Diversity with Leaders & Bizarre Task  
Dr. R. E. Sankar

I believe its the most vibrant & productive department in every aspects of an academic unit, comprising of students, teachers & technical staff, full of zeal & dedication.

Sudhir Verma  
Dr. SUDHIR VERMA

Brings out the best in you! for both academics & life... Two thumbs up for students and teachers.  
Dr. P. Jayaraj

The Department of Zoology constitutes of bright students and aptly qualified teachers - In and out classes interactions among both and formally & cordial and makes the teaching experience more enjoyable and memorable here.  
Dr. ARAB SINGH

Zoology Department is the most vibrant department of the College with blend of experienced and youthful teachers. The students and teachers have always maintained the reputation of the institute.  
Dr. On. PRAKASH

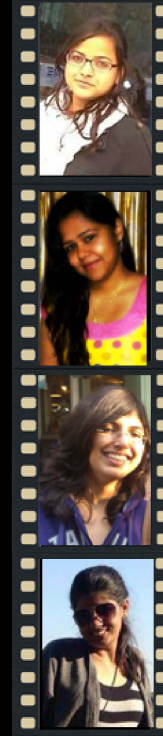
The honours course in Zoology has been and will remain the flagship course in the Science faculty. Despite all the upheavals in the syllabi and teacher composition, the one thing that stands high is our indomitable spirit, a never-say-die attitude and the hard work. Above all, we enjoy the camaraderie shared between students and teachers. A vibrant department that makes us hold our heads high in the academic circles. Together the best in years to come. Keep up the spirit!  
Dr. RAMA SINGHA

The teachers and students make up a family whose bonding is a way of life.  
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Front Cover by Tonirash and Bhavya; SZH

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Dr. (Mrs.) P. Hemalatha Reddy

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Dr. Mansi Verma

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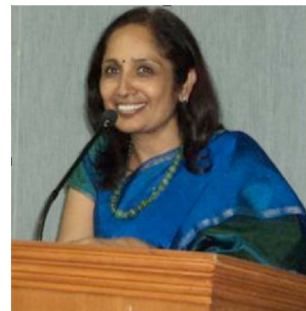
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# The Zoological Society 'Evolvere'



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Dr. P. Hemalatha Reddy  
Principal

శ్రీ వేంకటేశ్వర కళాశాల

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## From the Principal's Desk

The Department of Zoology has always been known for its academic excellence. This year as well, the college was honored by having Gold medalist in Zoology, Avantika Ghosh who has topped the University of Delhi at Undergraduate level. The department has successfully executed extracurricular activities like the Sarath Chandrah Memorial Lecture. An educational exchange programme was organized by the Tirumala Tripathi Devasthanams where a group of the department teachers and students interacted with other participant colleges at Tirupati, sharing their views on different topics. Its undergraduate students have participated enthusiastically in DBT and innovation projects and showcased their research at the Antardhwani Innovative Plaza.

The teachers of the department are extremely dedicated and continue to support the students in their ventures and guide them towards a better future.

With the second edition of the annual Zoology magazine 'Phoenix', the students have carried forward the trend. I give them my best wishes and hope that the magazine continues for many years to come.

Dr. Hemalatha Reddy



Dr. Anita Verma  
Convener



Dr. Mansi Verma  
Co-Convener

The Department of Zoology, full of life and spark, has maintained its worth since 1973. Along with serious academics, our Department rejuvenates every year with excursions and events organized by the Zoological Society, “Evolvere”. This year, we began with Sarath Chandran memorial lecture which was delivered by Dr. Rama Jayasundar, Department of NMR, AIIMS. Other activities of this year include excursions to Kolad and Manali, with a massive participation of students. Undergraduates were also taken to the National Zoological Park, Delhi for educational trip.

It gives us immense pleasure to come up with the second annual edition of “Phoenix”. In this edition, we have tried to compile many aspects of Zoology, including wild life, medical miracles, microbe’s world, nature etc. Zoology in itself is one of the oldest branches of science. Nevertheless, it encompasses almost all modern branches of biology and shows a strong interdisciplinary flavor. With this, we hope the efforts of our team results in transmission of knowledge and awareness about Zoology, at par from the course contents.

- Anita Verma & Mansi Verma

## From the Convener and Co-Convener

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As zoology students, more as students of science, we progress as our academic awareness broadens and evolves. These three years are our formative years as we step out of the comfort of the school classroom and leap into the increasingly complex and fascinating world of modern science.

With this increasing awareness and knowledge comes the realisation that to be able to express scientific thought coherently and clearly is perhaps as important as actually doing the thinking!

‘Phoenix’ is a medium for expression of our thoughts and even a way of showing that college students are too young and raw to be capable of rigorous scientific thoughts. ‘Phoenix’ is the official magazine of the Department of Zoology, now proudly presenting its second edition, publishing scientific and research information from various fields of biology.

The process of creating this magazine has taught us a great deal about our limitations as well as our potentials.

Thereby, we Anjali Mishra and Indu Malik, with the help of our team proudly present the annual academic magazine ‘PHOENIX’.

Most of all we hope that it is an enjoyable reading experience....

- Anjali Mishra & Indu Malik

## From the Chief Editors



# Our Zoology Department



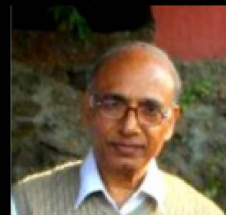
Dr. Rajesh Saxena - Mr. prim and proper. He does everything perfectly and expects the same from the rest of the department.

Ms. Ramaa Sinha - Wisdom personified. She has personality that demands respect and hard work.



Dr. K.V. Giri - Dude of all time. Dynamic Persona. He can teach every subject with ease!

Dr. V.V. S. Narayana Rao - The Hit Wit. He is spontaneous, glamorous, hilarious, and makes students WANT to attend classes on time!



Dr. P. S. Dhanaraj - Home Remedy. The solution to any problem a student could possibly have - and so the third year students have aptly tagged him "24x7 Helpline".

Dr. Anita Verma - Potrait of a Lady. Always calm, composed, crystal clear in her teaching.



# Our Zoology Department

Dr. Vartika Mathur - Ms. Beautiful Eyes. She specialises in insects, which she explains with her enriched ppt presentations.



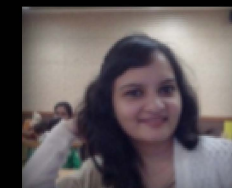
Dr. Om Prakash - Simple and sober. He teaches in a very scientific manner.

Dr. Ajaib Singh - Bindass. He teaches to the point and is the coolest teacher around.



Dr. Rajendra Phartyal - Complian Boy. He is taller than all of us and his jokes are stronger and sharper than any of ours.

Dr. Mansi Verma - Nucleus of our zoological cell. If you need work done before a deadline, contact Dr. Mansi.



Dr. P. Jayaraj - The boss. He has many feet in so many boats - paints, plays cricket, reads comic books, he dances and he can very well dissect!

Dr. Sudhir Verma - Master of practical application. He believes more in practicality than in theory, expects more than 75/75.



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## Angora Rabbit

We all are familiar with goat's, sheep's wool but here is something different and more smooth and warm ... this rabbit's long and soft hair . Angora rabbits are bred for their long wool, which may be removed by shearing

or plucking or gently pulling loose wool.

These rabbits were also famous as pets with French royalty in mid 1700's and their rein spread to other parts of Europe.

## Zombie Worms

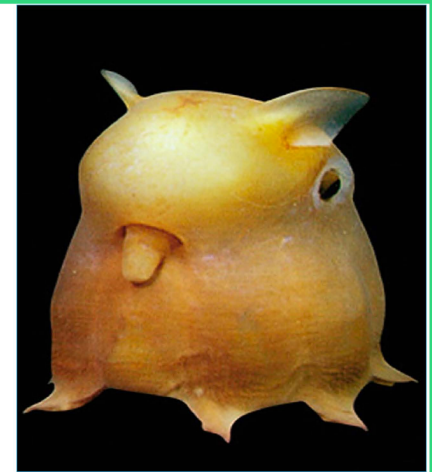
We've all heard of zombies eating flesh but these zombie worms like something more solid... BONES!! They feed off bones of whales and other scavenged sea creatures ... despite not having a mouth. And the secret behind it is that ...they secrete acid. Acids allow the worms to break down and absorb the hard bone. That's just the tip of the iceberg for these amazingly adapted worms. The females grow about an inch (3 cm) long, but males never grow larger than 1/20th of an inch (1 millimetre). They seem to live in the gelatinous tubes covering the females, serving no purpose but to fertilize her eggs. Weird!



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## Dumbo Octopus

Living at a depth of 7,000 meter below sea level the Dumbo octopus is the deepest-living octopus discovered. It belongs to the genus Grimpoteuthis and is called the Dumbo octopus due to its large ear-like fins protruding from the top of their its head resembling the ears of Walt Disney's flying elephant. It sure is good to know that after miles of vertical water and untold horrors some deep sea creatures look like Disney cartoon characters.



## Bleeding Stone



Tunicates are just 'weird'. Although extremely primitive and almost entirely immobile, these inorganic-looking entities are, in fact, animals! They are not conventional invertebrates, either. Belonging to a subphylum of the chordates, they are actually related to vertebrates... Pyura chilensis is one of the more shockingly bizarre tunicates, and seems to disprove the popular wisdom that you cannot get "blood from a stone." The creature looks for all the world like an ancient, craggy rock, but inside is bright, red flesh. these are also called "sea tomatoes", and people of Chile are very fond of eating it.

## Aye-Aye



Living in Madagascar...It's the world's largest nocturnal primate. It has rodent like teeth with a long, thin middle finger to live in the same place as the woodpecker. It has a unique way of finding food – it taps on trees to find grubs, then gnaws holes in the wood and inserts its elongated middle finger to pull them out.



## Hot Pink Slug



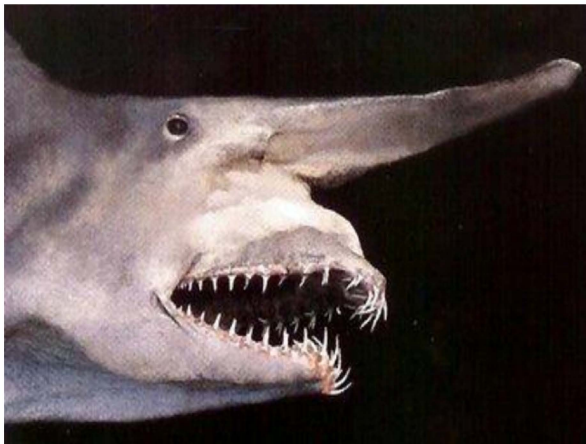
He's big. He's slimy. And he's ... neon pink?! Meet *Triboniophorus graeffei*, a new species of 8-inch-long (20-centimeter-long) slug that's found only on one Australian mountain.

These pink slugs live in beds of red eucalyptus leaves. Researchers suspect their colour could potentially serve as camouflage, helping the animals blend into their leafy habitat.

You know these creepy creatures play important roles in their ecosystems—for example, by recycling plant matter, in the formation of humus in forests and certain grasslands, give rare plants more of a chance by eliminating weeds, and are an important food source for all sorts of animal species.

## Goblin Shark

The Goblin shark is truly one strange creature. It is easy to understand how it got its name when you see it, for it looks like something straight out of a Stephen King movie.

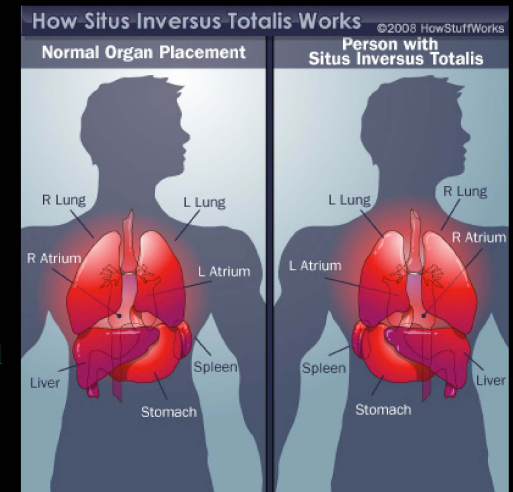


The Goblin shark has only been encountered a few times and very little is known about it. What is known is that it is a slow moving deep sea shark that lives at depths of 1200m/4000ft in seas around the world. It is also referred to as a living fossil.

This species looks unlike any other shark, with an elongated, flattened snout, highly protrusible jaws containing prominent nail-like teeth, and pink coloration. Goblin sharks have been observed in the western Indian Ocean, western Pacific Ocean and most of the Atlantic.

## Situs Inversus

Situs Inversus is a rare condition affecting less than 1 in 10,000 individuals where the main organs in the abdomen and thorax are mirrored or flipped in position. The heart will be present on right hand side, while the stomach and spleen switches places with the liver and gall bladder, while the intestines and other organs are "misplaced".



Complications can result from misaligned blood vessels.

Although the condition is rather odd, patients appear normal externally, and usually live normal lives. Leonardo Da Vinci was the first person to observe the disease and draw it in his notes.

## Strange Medical Conditions



## Stone Man's Disease

Just imagine your muscles turning into solid bones... It might sound like a horror story, but this is actually a real medical condition called Fibrodysplasia ossificans progressiva (FOP) or Stone Man's Disease. It is an extremely rare disease of the connective

tissue. Here, bone tissue begins to grow where muscles, tendons, and other connective tissues should be, effectively restricting movement. The person suffering will grow a second skeleton turning them into living statues. Still the heart and other organs do not grow bone tissue as they are made up of different type of muscles.

Around the world, there have only been 800 confirmed cases, and there is no known cure or treatment other than painkillers. Surgical removal of the extra bone growths has been shown to cause the body to "repair" the affected area with more bone causing more harm than good.



# The Girl Allergic to Water

We all use water daily in huge quantities for our basic survival. We have also heard of different kinds of allergies - people being allergic to milk, metal, etc... But imagine a person allergic to water!

She can't go swimming or soak in a hot bath. Even sweating brings this 19-year-old out in a painful rash.



Ashleigh, from Melbourne, Australia, is allergic to water of any temperature, a condition she's lived with since she was 14. She suffers from an extremely rare skin disorder called Aquagenic Urticaria - so unusual that only a handful of cases are documented worldwide. The defining symptom is a painful skin reaction resulting from contact with water.



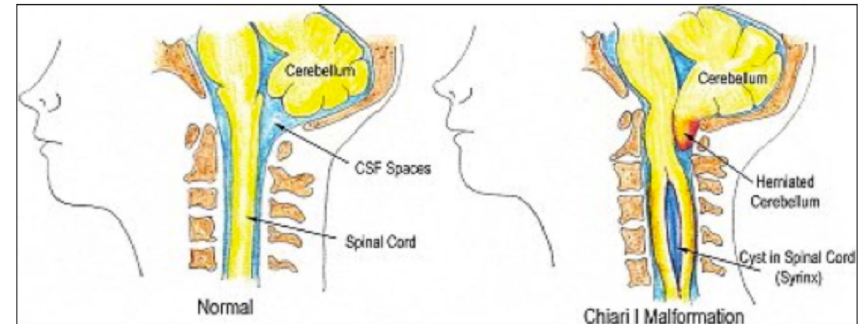
## Ostrich People

Have you ever seen people with ostrich feet?

There is a tribe of people living in Zimbabwe known as the Vadoma, that have become known as the "Ostrich People" for the prevalence of electro-dactyly in their population. Many people of the tribe are

born with fused toes that appear ostrich like. The number of people with such a defect is low due to their relative isolation. But these people are not considered as handicapped, they are very well integrated in their tribe.

# Chiari Malformation



Some sleep more, some maybe less than others, but we all need to sleep.

Rhett remains awake nearly 24 hours a day, and his condition has baffled his parents and doctors for years. They did everything to find out what was wrong with him ... checked his every sleep-deprived mood to determine what is causing it.

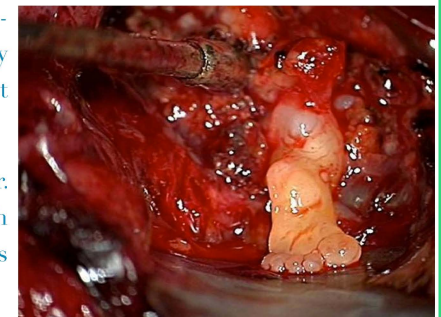
Doctors discovered that he is suffering from a rare disorder "Chiari Malformation".

What happens in Chiari Malformation is that the brain literally is squeezed into the spinal column. The person suffers compression, squeezing, strangulation of the brain stem performs vital functions that control sleep, speech, cranial nerves, circulatory system and our breathing system. To treat this disorder surgical decompression of the skull is necessary.

## Foot Found in Infant's Brain

The case of Sam Esquibel is making waves throughout the medical community. The three-day-old boy underwent surgery to remove a perfectly formed foot from his brain.

The exact cause of the growth is currently unclear. Doctors point to a condition "fetus in fetus," which is a rare abnormality that occurs when a fetus gets trapped inside its twin.



Scientists believe that the incidence of one twin absorbing the other in the womb occurs in one of every 500,000 live births.

In 2005, doctors in Bangladesh said they removed a long-dead fetus from the abdomen of 16-year-old Abu Raihan, according to the BBC. The fetus, which had grown like a tumor and weighed nearly five pounds, would have become the boy's twin had it developed normally, they said.



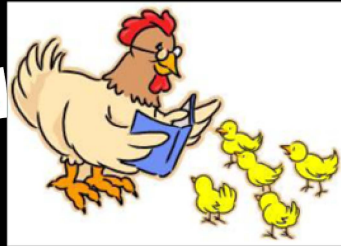


## Crocodiles Cry **TRUE**

Heard the term 'crocodile tears?' Crocodiles actually weep while both luring and killing their prey. Crocodiles can't chew, so they are forced to rip their food into chunks and swallow them whole. The glands that keep their eyes moist are right near their throats, so their eating habits actually force tears into their eyes.

## Chickens are Dumb **FALSE**

Chickens are one of the smartest animals of the bird family. They have been proven to worry and think about the future. Studies have showed that the way the neurons are organized in the brain of the chicken is similar to the way humans' brains are constructed. In other words, these birds have evolved to a complex level of intelligence.



## Female Praying Mantises Eat the Males After Mating **FALSE**

A popular misconception is that female praying mantises display sexual cannibalism – that is, they bite off the heads of the males during copulation. Early researchers thought that removal of the male's head was a reproductive strategy by females to enhance fertilization while obtaining sustenance. Later, this behavior appeared to be



an artifact of intrusive laboratory observation. Mantises are highly visual organisms, and notice any disturbance occurring in the laboratory or field such as bright lights or moving scientists. When observed via hidden cameras, the female displayed cannibalism in only 1 out of 69 cases. Cannibalism in the mantis is not casually associated with sexual behaviour, but occurs in association with it when females were hungry.

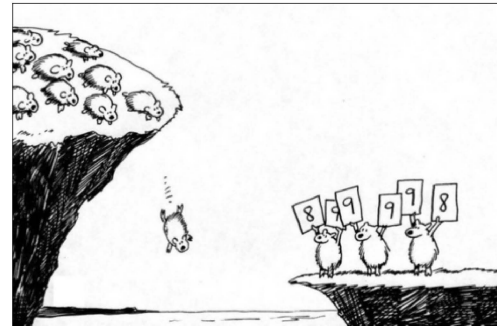
# Myths Vs. Reality

## 19 Goldfish Have 3-Second Memory **FALSE**

This is actually far from the truth as goldfish have been proven to have a memory span of up to three months. Studies on their intelligence have also shown that they can distinguish between different shapes, colors, sounds and different times of day. Other studies suggest that they are socially aware.



"I'm reading this book on 'How To Improve Your Memory', but I keep losing my place"



## Lemmings Commit Mass-Suicide **FALSE**

A popular misconception about these animals is that they commit mass suicide during migration. This myth likely comes about from the fact that every three or four years, their population drops to near extinction only to skyrocket again, but the ebb and flow is a result of migration in large groups, which can include jumping off cliffs into the water and swimming great distances to the point of exhaustion and even death.

## Ostriches bury their heads in the sand **FALSE**

Contrary to popular belief, ostriches do not bury their heads in the sand when they're scared or threatened. The myth probably originates from the bird's defensive behavior of lying low at the approach of trouble and pressing their long necks to the ground in an attempt to become less visible. Ostriches also dig holes in the dirt to use as shared nests for their eggs and turn the eggs many times a day. So it can really look like the birds are burying their heads in the sand.







## Can Extinct Species be Revived?

A roughly 10,000-year-old specimen of female mammoth recently found on Russia's Novosibirsk Islands remained wonderfully intact in the northern deep freeze. It appears to have preserved a great extent of soft tissues over the carcass.

But a peculiar liquid found around the carcass is what has been making headlines –researchers think this fluid is mammoth blood, that may contain viable cells. This would seem to bring the possibility of resurrecting a mammoth closer than ever before. DNA begins to break down at death, so paleogeneticists would likely draw only scraps of genetic material from the mammoth. They could then try to place those scraps into a DNA patchwork of the best approximation of what we think a mammoth's genome would be like.

If possible we might be able to see them again... but is trying to find a place for Ice Age mammoths in a warming world actually a good idea?

## Predict Your Time of Death

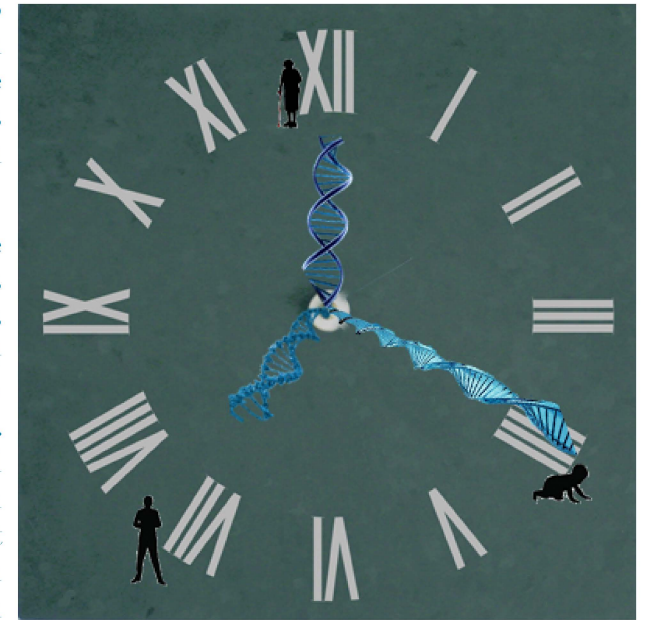
Our internal 'biological clocks' help in regulating various aspects of the human biology as well as behavioural patterns. This biological clock can also influence timings of medical events such as heart attacks and strokes. Scientists identified a variant of the gene that could determine when a person will die. In the research, wake-sleep patterns of people were compared along with their genotypes.

Researchers found a single nucleotide (nucleotides are responsible for making the basic units of RNA and DNA molecules) near the gene known as Period 1. At this site, around 60 percent people have nucleotide base A or Adenine and 40 percent have G or Guanine.

This particular genotype affects sleep-wake patterns so that people who have the A-A genotype wake up about an hour earlier than the people who have the G-G genotype, and the A-Gs wake up almost exactly in the middle

Expression of Period 1 gene remained lower in brains as well as white blood cells of individuals with G-G genotype than with A-A genotype, but only in daytime. Virtually all physiological processes have a circadian rhythm which means that these occur in the certain parts of a day. There is even a circadian rhythm of the death, so that in the general population people tend on average to be most likely to die in the morning hours – with 11 am as an average.

“So there is really a gene that predicts the time of day that you’ll die. Not the date, fortunately, but the time of day,” said Clifford Saper, co-author of the study.





# A Cure For Cancer One Step Closer

Scientists designed Peptide-based Delivery Platforms to cure Cancer

Scientists at CSIR-Centre for Cellular and Molecular Biology (CCMB) invented peptide-based delivery platforms for targeting tumours. This can be helpful in curing cancer. This platform was developed by using bacterial fermentation to bind DNA or small interfering RNA (siRNA) or short hairpin RNA (shRNA) and delivering them into cells to target tumours.



Given that DNA, siRNA and shRNA are negatively-charged, they need carriers like recombinant proteins, said Dr. Vijaya Gopal, senior principal scientist. The benefit of DNA or siRNA is that they help in silencing the targeted genes.

For example, if the TF gene involved in new blood vessel formation is silenced, the tumour will degenerate.

The scientists developed chimeric peptide by fusing three peptide modules to deliver DNA or shRNA for degenerating tumours. Chimeric proteins are proteins with varied functional properties which can be obtained from any organism or a virus and produced in bacterial factories using standard practices of recombinant DNA method.

The advantage of using chimeric proteins is that they could be changed to target different tumours. Scientists are making efforts to evolve peptide-based platform technology with other homing ligands recognising different targets.

# Artificial Heart



When the heart breaks down, it means the end of life for most because there are hardly any donors for the organ. However, Carmat, a French company, has announced the transplant of an artificial heart.

At 900 grams , it is three times heavier than the natural human heart and it costs between 140,000 to 180,000 Euro in Europe. The first such heart is working in a man in Paris. It derives power from lithium batteries, mimicking human heart muscle contractions and contains sensors that adapt the blood flow to the patient's moves.

The sheer size of the artificial heart means it can fit in 86% of men but only around 20% of women - but Carmat says it could easily manufacture a smaller version to fit the smaller bodies of women as well as patients in India and China.

In case you don't have a stomach for this heart, another company, Medtronic, developed and implanted the world's smallest pacemaker – without surgery . The tiny device is just 2.4 cm – one inch – long and inserted through a small incision in the thigh.



# What's More Radioactive Than Nuclear Waste?

Coal is believed to be responsible for a host of many problems, such as mining accidents, acid rain and greenhouse gas emissions. However, it's never been believed to be quite as harmful as nuclear waste. Over the past few decades, however, a series of studies has called these stereotypes into question. Among the surprising conclusions: the waste produced by coal plants is actually more radioactive than that generated by their nuclear counterparts. In fact, the fly ash emitted by a power plant—a by-product from burning coal for electricity—carries into the surrounding environment 100 times more radiation than a nuclear power plant producing the same amount of energy. At issue is coal's content of uranium and thorium, both radioactive elements. They occur in such trace amounts in natural coal that they aren't a problem. But when coal is burned into fly ash, uranium

and thorium are concentrated at up to 10 times their original levels. Fly ash uranium leaches into the soil and water surrounding a coal plant, affecting cropland and, in turn, food. People living within a "stack shadow"—the area within a half- to one-mile radius of a coal plant's smokestacks—might then ingest small

amounts of radiation.

It was estimated that individuals living near coal-fired installations are exposed to a maximum of 1.9 millirems of fly ash radiation yearly. But it is assumed that health risks from radiation in coal by-products are low. It is emphasized that other products of coal power, like emissions of acid rain-producing sulfur dioxide and smog-forming nitrous oxide, pose greater health risks than radiation. So why does coal waste appear so radioactive? Radiation from uranium and other elements in coal might only form a genuine health risk to miners. It's more of an occupational hazard than a general environmental hazard.



## 25 From the Ocean Bed, With Love

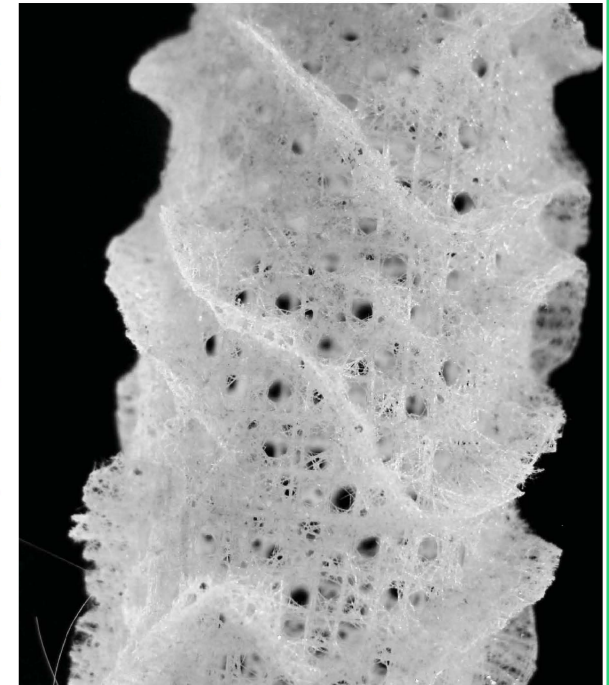
*Euplectella aspergillum*, a porifera (most primitive animals) is gifted to newlywed couples of regions of coastal Asia in a dead and dry state. It symbolizes eternal love and good luck. This tradition, unlike many, has scientific facts as basis.

The sponge is about 10 cm tube with tiny holes through which a pair of young shrimp, *Spongicola*, can enter and grow, becoming too big to escape. The sponge provides them food, so they easily survive together, reproduce when mature and die together. Thus, the dry skeleton of the sponges make an apt wedding present.

The relationship between the sponge and the shrimps is that of commensalism where only the shrimp benefit while the sponges are not affected.

The sponge is also called Venus' flower basket because of its intricate skeleton structure. The porous structure is made purely of silica. Giving this animal the name 'glass sponge'. The beautiful structure looks like a glass palace for the shrimp.

Till death do the shrimp apart!

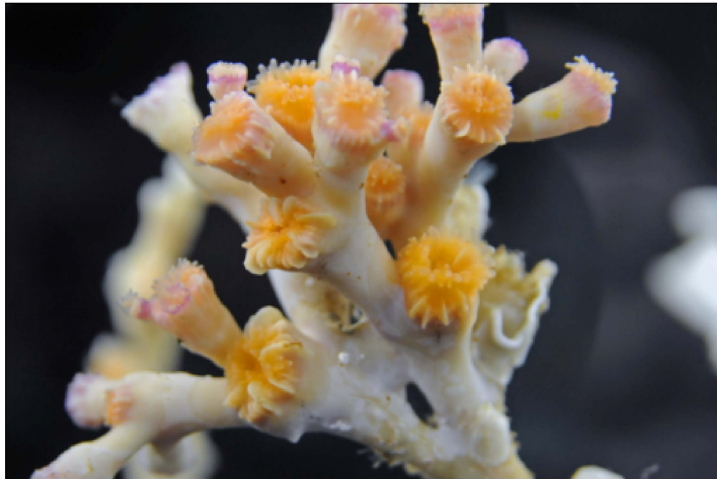




# Cold Water Coral

Scientists discovered on 2 November 2010 a cold water coral reef off the coast of Mauritania in Northern Africa, in the middle of a huge rock formation in an undersea canyon. This coral wall on the continental shelf off the coast of Mauritania measures about 50 to 60 meters high and is 190 long. The scientists lowered a robot 2000 feet underwater to discover the cold water coral.

Scientists found animals like Lophelia coral with orange-red polyps and gorgonias coral in the discovered ecosystem. Carrier crab *Paromola* and the giant deep sea oyster *Neopycnodonte* were also found. These giant oysters, also never before observed so far south, form thick populations and some individuals can live for over 500 years.



Cold water corals, unlike tropical corals live at 13 degrees Celsius (55 degrees Fahrenheit), in the dark and nutrient-rich deep sea region below 200 m (650 feet). Usually, cold water coral ecosystems are found much further north, near Scandinavian region and in the Irish Sea, so this is the first time cold water coral has been found so far south.

The cold water coral ecosystem might have been possible because of offshore winds pushing the surface waters from the Mauritanian cliffs out into the open ocean. This could have created a flow of cold and nutrient-rich water to the coral ecosystems, making their growth possible.

# Obesity Due to Hunger Gene?



Some people are able to tuck into chocolate every day and not gain weight, while others struggle to keep their weight down regardless of what they eat. Exactly why this is has been unclear, but now researchers point to a genetic mutation as the cause.

Researchers analyzed the genetic sequences of 2,101 children suffering from early-onset obesity, and compared these with the sequences of children of a normal, healthy weight. Results of the analysis revealed that children who showed a mutation in the *KSR2* gene demonstrated an increased appetite, slower metabolism, lower heart rate and severe insulin resistance compared with those who had a normal version of the gene.

Further experiments in cells also revealed that *KSR2* mutations impaired metabolic processes, such as glucose and fatty acid oxidation.

## Did You Know?

- We share 7% of genetic material with the *E.coli* bacteria, 21% with worms, 90% with mice and 98% with chimpanzees.
- The full stop at the end of a sentence is the size of one thousand cell nuclei.

# Now Regenerate Missing or Damaged Bones!

Research led by the University of Iowa has tested a “bio patch” that regenerates missing or damaged bone by inserting DNA into nano-sized plasmids to deliver bone-making genetic instructions directly into cells. The method succeeded in regrowing enough bone to fully cover skull wounds in live rats. And, in test tubes, it also stimulated new growth in human bone marrow stromal cells.

Using pieces of DNA that encode for a platelet-derived growth factor called PDGF-B, the researchers delivered genetic instructions directly into living bone cells, causing them to make the proteins that lead to more bone production.







- Microbes have been around longer than anything else on Earth, longer than even the dinosaurs. If we imagine Earth began as a single day; Microbes appeared at 5am, dinosaurs appeared at 10pm... and humans appeared seconds before midnight.

- There are 10 times more bacteria in the average human's digestive system than there are cells in the entire body. This is approximately 1kg of bacteria.

- There are more microbes on one person's hand than there are people on the planet.
- Microbes generate at least half the oxygen we breathe.



- Some dentists recommend that a toothbrush should be kept at least 2 metres away from a toilet to avoid air-borne particles resulting from the flush to stick on it – what a large bathroom!!

- Dr Winkle Weinberg, an infectious diseases expert, reckons that when we have a cold and cough, the virus particles can travel at 320 kilometres an hour and up to 900 metres. That is faster than any passenger jet at takeoff!!

- The dirtiest spots in the kitchen are dishclothes, cutting boards, sponges, and sink handles. Surprisingly, the floor is often cleaner than the sink!
- The human mouth is home to more than 500 species of bacteria. Each square centimeter of our skin averages about 100,000 bacteria.



- Microbes are responsible for creating foods such as wine, cheese, vinegar, yogurt, etc. etc.

- While most microbes are harmless to humans, a small fraction are capable of causing diseases and are responsible for millions of human and animal deaths throughout the centuries. These disease-causing microbes are the ones we call "germs."

- One single teaspoon of soil contains 1 billion bacteria & 120,000 fungi & 25,000 algae.



# The Secret Life of Microbes

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## Your Smart Phone or a Microbial Community?



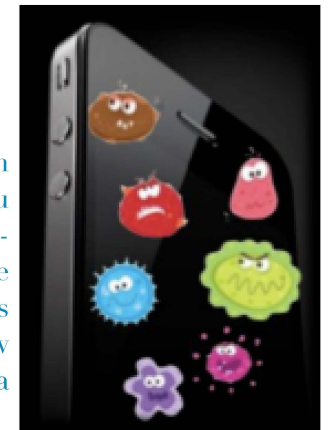
Want to hear something scary about your smart phone? No, no, ghosts and zombies have nothing to do with your smart phone. That little electronic device of yours can be downright frightening. Frighteningly germ, that is!

We take our cell phones everywhere, use them almost anywhere, and set them on nearly any available surface. We even share them with others. They are exposed to many bacteria. The reason for this microbial growth on the handsets lies in the fact that germs thrive in warm places. Not only does your smart phone generate its own heat, but it also gets some help from your own body heat. In fact, not many people think to disinfect their phones. No wonder, smart phones are prime breeding grounds for bacteria. Typical phones have more bacteria than your office workspace, and some have even more than a toilet seat.

A study involving the phones of 200 hospital staff members found that 94.5 percent of the phones were contaminated with bacteria, many of which were resistant to antibiotics. About 30 percent of the bacteria on the phones ended up on the owner's hands. Much of these disease-causing bacteria are transferred from one person another through touch, which means that once this bacteria is on your hand, you only have to then touch your eyes or nose for the bacteria to find an easy route into your body.

### How to Ward Off This Situation?!

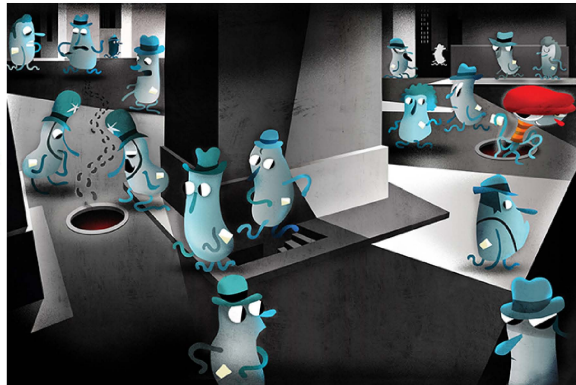
Some companies offer anti-microbial shells and screen protectors to guard against these scary germs, but you can keep your phone relatively germ free by simply wiping it with antibacterial wipes, swabbing it with some alcohol or even rolling it around in your damp hands the next time you use hand sanitizer. With just a few simple steps, you can banish the boogiemen bacteria from your smart phone for good.





## Dhoom 4 - *Mycobacterium tuberculosis* - The Smartest Thief!

Since time immemorial, infections caused by *M. tuberculosis* have been a major area of concern for scientists. Researchers have tried to trace how these clever thieves (*M. tuberculosis*) infect the human body despite the presence of intelligent cops (our immune system).



Lately, the collaborative efforts of University of Washington and the Seattle Biomedical Research Institute have unearthed the spy door by which these bacteria escape the immune system. Scientists studied that TB pathogens do not stay in upper respiratory tract for long as this area is under strong surveillance of immune cells. Moreover, many bacteria already reside in the upper respiratory tract, hence the survival of TB pathogens become difficult. Like any thief, *M. tuberculosis* hunts for a place where no one can catch them. They try to reach the sterile lower respiratory tract, which is their preferable niche. The bacteria deceive the macrophages by concealing themselves under a protective layer of lipids, called PDIM (phthiocerol dimycocerosate).

This fantastic masquerade masks pathogen-associated molecular patterns (PAMPs) on mycobacteria. Usually, PAMPs act as toll-like receptors for macrophages and destine the pathogen's death. At the same time, another accessory lipid, PGL (phenolic glycolipids) on the bacterial surface invokes permissive macrophages to take these pathogens to their targeted destination.

Studies by Ramakrishnan and her group have shown the role of PGL in increasing TB's infectivity. This even explains how small droplets of TB infection may fool the immune system in comparison to larger droplets! With this effort of Ramakrishnan, many grubby secrets of *M. tuberculosis* have been revealed. Now as the mode of escape of these intelligent pathogens has been explored, it can be expected that some drug will be designed to cure the emerging problem of MDRs soon.

## Wildlife in Peril

Conservation of wildlife is a global concern today as the rate of wildlife depletion has increased alarmingly, due to increased incidents of wildlife crimes. Wildlife crime is classified as the taking, trading, trafficking, exploiting or possessing protected flora and fauna.

India has witnessed substantially high number of wildlife crimes. According to a report by the Environmental Investigation Agency (EIA) in 2004, India is the chief target for the traders of wildlife skin. Between 1994 and 2003, 784 cases of trading of the skins of tiger, leopard or otter have been reported. Is it the market demand or shortage in legal action to mitigate this crime? Despite wildlife protection acts, the illegal trade in wildlife continues to flourish. The reason for the alarming increase is the time taken to award punishments to offenders. So, criminals know they probably won't get caught - and if they do, there is a poor chance of getting convicted.

How do we stop this? Extinction rates are skyrocketing. Soon a great many species of flora and fauna will be wiped out forever.

Before it's too late we need to improve implementation of the law. Changes in law and NGO work along will not solve our problems. Unless people are made aware and actively contribute to the protection of wildlife, we will soon live in a world without a great many beautiful and majestic beings.



Nature Calling Nature





## India Ranks Pitiably on Global EPI

As per the Environmental Performance Index (EPI) released on 25 January 2014, India has been ranked 155 out of 178 countries with an index score of 31.23 points in its efforts to address environmental challenges. India was ranked behind neighboring countries China at 118, Pakistan at 148 and Nepal at 139. The EPI is prepared by Yale and Columbia Universities in collaboration with the World Economic Forum (WEF), with support from the Samuel Family Foundation and the McCall Mac Bain Foundation. EPI is constructed through the calculation and aggregation of 20 indicators reflecting national-level environmental data.



EPI ranks how well countries perform on high-priority environmental issues mainly in the areas of protection of human health from environmental harm and protection of ecosystems.

Other highlights of the EPI:

The two objectives of EPI are Environmental Health and Ecosystem Vitality.

178 nations in the index represent 99 per cent of the global population, 98 per cent of the world's total land area, and 97 per cent of the global GDP.

The country with the highest EPI is Switzerland followed by Luxembourg, Australia, Singapore, and Czech Republic.

- The bottom five performers in the EPI are Somalia, Mali, Haiti, Lesotho, and Afghanistan. All the low performers are grappling with civil unrest, significant economic development pressures, and political turmoil. Urbanization without sufficient investment in environmental safeguards is the key reason for emerging countries to be poor when it comes to air quality, biodiversity and habitat protection.

## A Greenhouse Gas 7000x More Potent Than CO<sub>2</sub>



Burning fossil fuels releases CO<sub>2</sub> into the atmosphere. Photosynthesis and respiration in plants, animals, fungi, bacteria, etc. leads to exchange of carbon between the CO<sub>2</sub> in the atmosphere and carbon compounds in the organisms. But humans are now throwing this natural carbon cycle out of balance. Percentage of CO<sub>2</sub> in the air has increased from

about 289 ppm (parts per million) before the industrial revolution to over 360 ppm and is still rising, as a result global temperatures are expected to increase. Global average temperatures are expected to be 2-5°C (3.6-9°F) higher by the time CO<sub>2</sub> doubles in concentration. The temperature rise will be small in the tropics but much greater at high latitudes.

Scientists at University of Toronto have discovered a long-lived manmade greenhouse gas (GHG) called Perfluorotributylamine (PFTBA) that is 7100 times more potent than carbon dioxide at warming the Earth over a 100-year time span. The newly discovered gas which does not occur naturally is being used in the electrical industry, such as in transistors and capacitors. Concentrations of PFTBA in the atmosphere are low— 0.18 parts per trillion as compared to 400 ppm for CO<sub>2</sub>. PFTBA does not in any way displace the burning of fossil fuels as the main drivers of climate change.

PFTBA's atmospheric concentration does not significantly alter the phenomenon of climate change. However, it has the highest radiative efficiency of any molecule detected in the atmosphere to date. It was estimated that PFTBA remains in the atmosphere for about 500 years. Unlike CO<sub>2</sub> which is taken up by forests and oceans, there are no known natural "sinks" on Earth to absorb it. The discovery of PFTBA and its warming potential raises questions about the climate impacts of other chemicals used in industries.





# Urbanization - The Necessary Evil of Modern Life

‘Change is the only constant’ - a truism that applies best to evolution, which is a never ending and an ever going phenomenon. Although evolutionary forces are at play continuously, it is virtually impossible to perceive the occurrence in most cases. This is because the selection pressures are mild at any given time in peaceful habitats where organisms go about their business by maintaining respectable distance from each other or, they interact in various ways, whereby they favour the cause of improving their lifestyles in the struggle for existence. Thus, left to nature, i.e., undisturbed by man, organisms interact with each other and mutually influence change; a process called coevolution that maintains the delicate web of life. Evolutionary forces, albeit imperceptible in a short span of time, nevertheless prove their effect by being persistent and so the cumulative outcome is realized only after a long time. Milder forces give species ample time to adjust to each other’s changes. As a corollary, drastic alteration in the environmental conditions is bound to cause serious disturbances resulting in impoverishing biodiversity.

Climate changes and pollution, the two major evils of modernization/urbanization have had their major share of negative impact on mankind, something that took us years to understand, despite the fact that they have been responsible for many of the lifestyle diseases. The effect of urbanization on the evolutionary patterns and directions are even less understood due to their covert nature, but they may have a far reaching and deeper negative impact that will be impossible to revert. Evolutionary change as we know is a one way ticket; we may be the cause of the change by our actions, but we can neither predict nor foresee or wish or positive changes.

Since evolutionary changes cannot be foreseen due to (i) the complex nature of species interactions; and (ii) the long spell of time taken to occur, they can only be analysed in retrospection, as a sort of looking backward to understand how things moved forward!



The data collected from innumerable such studies and the knowledge so gained offers us a kind of baseline to make some sort of guesses with respect to possible outcomes of changes in the biota under certain situations. These situations by and large are drastic ecological disturbances brought about presently by manmade causes. Urbanization, in a way, is a sort of excess committed by man on nature. In its wake, it has been responsible for large-scale upsets in the delicate balance of nature.

The recent disaster at Uttarakhand has been precipitated by human action, like deforestation, mining, building and construction, all of which have choked the river flow, swelling it up and submerging vast areas of land. Prior knowledge makes us predict that pests and pathogens will be on rise in such a scenario. Biologically speaking, the pests and pathogens become evolutionarily successful from their own viewpoint. However, humans being the most selfish species view such a change as disastrous, since it proves to be harmful to them. We as a species view evolution with tinted glasses, as we want whatever changes that result by our actions or otherwise, to be beneficial to us or atleast that which cause no harm.

Urbanization is one such aspect that is sure to have repercussions on the evolutionary course of several species. Global warming, one of the resultant effects of urbanization has apart from causing serious changes in climatic patterns, also altered migratory behaviour, and body size changes in many species. Urbanization has imposed behavioural changes too; why for that matter, even the hostile behaviour of men towards each other in urban areas is on the rise. Mobile tower signals have been responsible for the decline in many insect species, and in turn the decline in insectivorous birds and bats that prey on them. Should we care? Yes, we should, although it is again for selfish reasons, because most of the insects that have declined are pollinators. However, some insects have boomed in numbers like the mosquito, and one of the causes attributed apart from the many that we already know is the decline in dragonfly population.

These are but a few examples and the list can go on. All in all, to sum up, since so far changes observed under wide scale urbanization have not been positive with respect to economically useful species, we may conclude that: Modern living may be only a short term gain for us comfort-seekers by making overt changes in the environment, but we may suffer by covert changes in the evolution of species around us that will probably backfire on us someday, and that future might not be too far off.



# Nature Into Technology

## The Bombardier Beetle's Fuel Injection System Beats Any Car

These beetles spray noxious chemicals from a turret on the end of its abdomen.

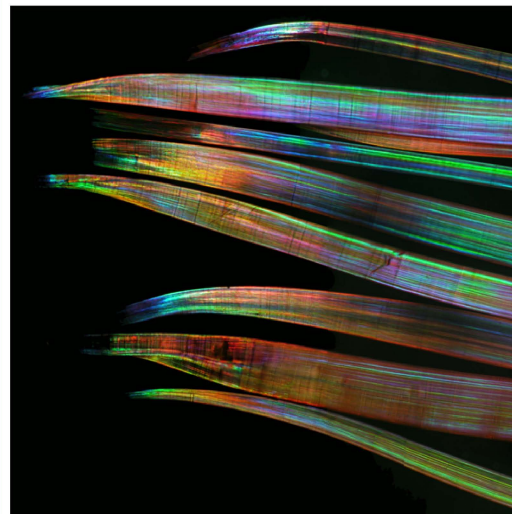
It's like a little chemical warfare tank that will go off with just the slightest bit of provocation. Inside, it has two different chemicals and a mixing chamber. The chemicals react and get so hot that pressure builds in the chamber, which is then released through the openings on the beetle's abdomen. It can squirt the burning jet up to 20 centimeters. It shoots quick-fire pulses like a machine gun -- one that can fire up to 500 times a second.



## How We Can Adapt it

The beetle design allows us to control the temperature, velocity and size of the droplets being sprayed, which means the potential applications are nearly endless. For instances, better fuel efficiency and lower emissions in vehicles and a new type of gas-turbine aircraft engine that can reignite in mid-flight if it loses power or simply needle-free injections.

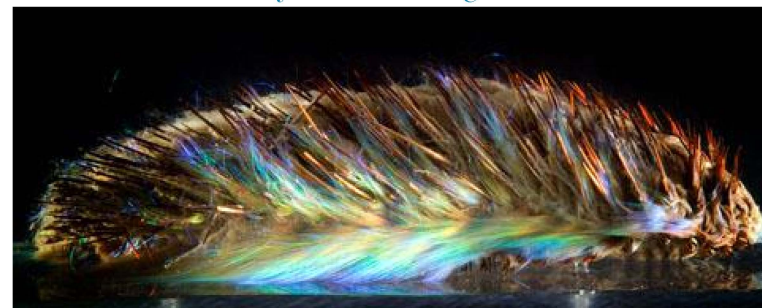
## The Sea Mouse's Fur Is Made of Super-Efficient Fiber-Optic Cable



The sides of the sea mouse are covered in thin hairs, called setae that glow red, blue or green depending on how the light hits them.

## How We Can Adapt it

The fastest communication cables are the fiber-optic lines that zip light along a series of thin, perfectly clear glass hairs. But the little clear hairs that grow on the back of that tiny sea worm are much, much more efficient than the cables we're using. All fiber-optic cables lose some of their signal over a distance. Fiber optics work by controlling the reflection of the light so that it bounces perfectly along the length of the cable. The survival of the worm depends on its ability to light up its coat, that's how it wards off predators. And its coat won't light up without exterior light hitting it. And it lives thousands of feet under the surface of the ocean, where virtually no light can reach. Therefore, millions of years of not wanting to die have allowed it to evolve spines that are nearly 100 percent efficient in their ability to reflect light.





# The Blue Morpho Butterfly Does Color Better Than Your LED TV

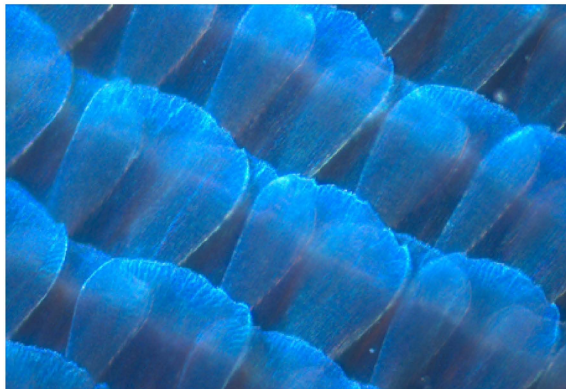
The Blue Morpho seems to have given itself the gaudy bluish bright color. How it achieves that color is kind of amazing. Any object appears the same colour as the wavelength of light it reflects. This butterfly, however, has wings covered in layers of semi reflective scales. Their “colour” is determined by the wavelengths of light interfering with each other. So, the brilliant blue is actually every color in the spectrum being reflected in a particular way so that blue is amplified.



## How We Can Adapt it

Scientists mimic the butterfly with two reflective layers with a very small space in between. The top layer reflects some light and lets the rest through to be reflected

by the bottom layer. The distance between layers was adjusted by microscopic amounts and it can produce mind-blowing colors using just the ambient light in the room.



# The Namib Desert Beetle is a State-of-the-Art Water Collection System



The Namib Desert in Africa is one of the driest places on earth, yet the Namib Desert beetle thrives there. The beetle stands facing the wind, using its hind legs to prop itself up to a 45-degree angle, and then let the tiny water droplets collect on its back. The condensation builds until it rolls down to its mouth for a nice morning drink.

## How We Can Adapt it

Worldwide, 884 million people lack access to a safe water source. It would sure be nice to harvest fog and turn it into drinking water for them, but attempts to do so thus far have failed. One fog harvester in Chile gathers 4,000 gallons of water a day by using nets to collect condensation, but there's nothing stopping the wind from evaporating the water or blowing it clean off the nets before it can be collected.

The tiny bumps on the beetle's back are natural hydrophilic surfaces. But then the rest of the beetle's back is hydrophobic. So once the droplets get too big to hang onto the water-collecting bumps, they detach and roll down the beetle's back before the heat and wind can steal the water away.



To replicate this, researchers took small beads of glass that attract water and covered their bases in a layer of water-repellant wax. As a result, they were able to capture water out of the air just like the Namib Desert beetle.



# Humans Versus Nature



Humans are considered the most intelligent, powerful creatures of the planet. But the more humans advance towards technology and science, the more humans interfere with nature for the sake leisure, pleasure or convenience. Since time immemorial, man has exploited the nature for his own comfort. With the industrial revolution and urbanization, millions of forests were cleared off to make room for inhabitation of the population, the wastes so produced out of industries were and are recklessly dumped in the wild, be it any

water body or the soil. Man has not even spared wildlife.

## How Strong Are Humans Against Nature?

Though mother nature bears all the abuse humans heap on the Earth, when the full powers of Nature's fury are loosed no science, no technology, no human brain can withstand them. The flash floods in July 2013 that swept away the Kedarnath temples are one example. It is considered to be the most devastating disaster after the 2004 Indian Ocean tsunami. As per the statistics, more than 5,700 people were 'presumed dead'. The affected area was devastated, left desolate. The incident proved yet again that in the face of nature's fury, humanity stands helpless.



It is the high time that humans learn a lesson from these natural disasters. Humanity may plunder natural resources, we may walk on the moon; but we should not forget that our lives lie in the hands of the nature, and playing with nature only threatens our own selves.

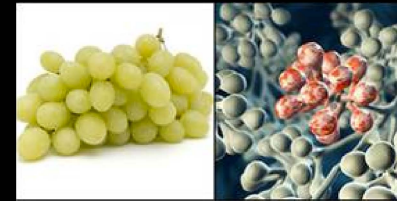
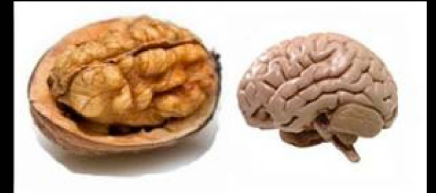
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Nature has the solution for all medical problems. It has even left us some hints... Now it's on us to seek them out!



Tomatoes are red in colour and chambered, quite like our heart. Research shows that tomatoes are loaded with lycopene, a plant chemical that helps to reduce risk of heart disease and cancer.

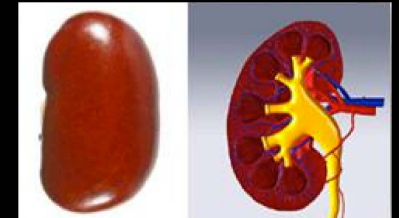
Walnuts resemble our brain. They help to develop more than three dozen neurotransmitters necessary for functioning of brain.



A bunch of grapes look exactly like alveoli of the lungs and they help to reduce risk of lung cancer and emphysema.

Nature's Pharmacy

Kidney beans actually heal and help maintain kidney function, and yes they look the same too.



Avocados resemble the female womb. They help to balance hormones, shed unwanted birth weight and even help to prevent cervical cancer

Figs are full of seeds and hang in twos when they grow. Figs increase motility of male sperms and even help to overcome sterility





There are many careers one has the option to pursue after studying Zoology. These are just some of them.

**Aquaculture:** Many graduates of Zoology are involved with the farming of aquatic organisms such as fish, crustaceans, molluscs and aquatic plants.

**Archaeology:** At least one, Zoology graduate is working at archaeological digs as an animal bones expert.

**Art & Media:** A number of Zoology graduates are working as artists or as wildlife photographers and wildlife illustrators. Famous Sir David Attenborough was a zoology graduate.

**Conservation:** Many Zoology graduates work in conservation, for example conservation development officer for the different Wildlife Trusts, or as Park Rangers for the National Parks and Wildlife Service. Others work in the laboratory assessing genetic diversity of threatened species.

**Embryologist:** Animal embryology and development are part of the courses taught in Zoology. This, with additional training has led one graduate to become an

embryologist in a fertility clinic.

**Environmental Management:** A number of graduates of Zoology work for governmental agencies, in environmental management, (e.g. the Environmental Protection Agency and the Marine Institute).

**Environmental Consultancy:** Some graduates work as freelance consultants for governmental agencies or industry in this capacity and some have set up successful companies in this area.

**Fisheries Management:** A number of Zoology graduates work for the Fisheries Board, which uses scientific research on fish populations to find ways to protect fishery resources and allow sustainable exploitation.

**Forensics:** The Zoology degree provides the skills and knowledge (eg. of molecular biology) to become a forensic scientist.

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**Journalism:** Due to the writing skills and knowledge acquired during a degree in zoology, this career is also very feasible.

**Marine Biologist:** Some Zoologists work as marine biologists for conservation agencies, government agencies and research groups from Universities.

**Museum Curation:** Many Zoology graduates learn skills in the identification of animals and also the organisational skills necessary for curation.

**Parasitology:** A number of Zoology graduates have become either animal parasitologists working in veterinary science or human parasitologists working in e.g. tropical medicine.

**Pest Control/Entomology:** At least one, zoology graduate has followed this career path from his experience in working with insects during his time in Zoology.

**Private Enterprise:** In addition to environmental consultancy firms, other initiatives include making a living out of diving, eco-tours, or underwater photography.

**Project Management:** Some Zoology graduates move away from field or lab based careers and into project management. The organisation and writing skills acquired during your degree makes this area very feasible.

**Laboratory Assistant & Research:** skills learnt during your degree in Zoology also make this career possible with graduates working as lab assistants in university laboratories and in R&D for industry. Many graduates stay on and do a PhD by research in one of the laboratories of Zoology academic staff at NUIG or go to other universities both in Ireland and abroad to do a PhD. Some of our recent graduates are working in the UK, the US, Germany, Australia, and South America.

**Taxonomist:** Skills in identifying animals are also useful for environmental consultancy firms, oil companies or as private consultants as well as academia.

**Teaching:** Zoology graduates have gone on to follow careers at all levels of teaching; at primary school, secondary school and third level.

**Veterinary:** A small number of zoology graduates have successfully used their Zoology degree to obtain a place on a veterinary science course.

**Zoo Keeper/Assistant:** At least one Zoology graduate is working as an education officer in a Zoo. Other possible positions include Zoo keeper and Zoo keeper assistants.

## A Cuckoo

A cuckoo came and sat on a tree  
feeling quite carefree.  
And chirping all alone  
Sob..sob..Why this world is so cruel to us?  
She had once thought that they were  
the beauty of this earth  
but now desolately she knows the truth.  
Her sorrowful twittering wishes that...  
'Someday People will realize our worth  
And we are necessary for the nature.'



Animals are endangered. People are so cruel that they have stopped caring about nature. All they know and are left with now is their greediness. Irrelevant of their own bright future. Save Wildlife Save Mankind.

- Varsha Chokkar, FZH

## Nature and Creature

Oh my darling don't go out  
The wind is whistling and the sky is dark with clouds  
And your butterfly has also gone away;



"No mummy I have to catch it".  
Her cheeks wet in tear drops ,  
the upper sky also drenched in rain  
And the clouds collided each other.  
Suddenly the door slammed by the wind,  
And the power cut off.  
thundering and lightning,  
Finally pour on the land.  
Nature has a systematic way of working

And it has the power even for destruction.  
This willing power has make the creature selfish.  
And when he tries to disturb the system of nature,  
Shows its real anger .  
Nature is an invisible string where the planets are compelled,  
whose director is behind the curtain.  
When the poles are disrupted within no time and  
the set up is collapsed,  
this relation will remain unexplained forever.  
Considering both as best friend  
And submit everything in front of each other  
Will make the nature peace and beautiful  
Place where green is preserved for generations.

- Varsha Chokkar, FZH

Creative Corner



## Teacher's Love

Teachers are like the candles,  
Which consumes themselves to brighten the lives of others.  
They are like the changing seasons.  
Sometime spring,  
When they nurture the root of beauty of education.  
For a while act like summer,  
Whose anger seems to kill us.  
And sometime behave as arriving winter,  
Whose blowing cold wind make us aware  
of what to do .  
The most cherished in this world ,  
Always lighten up the burdens.  
At last but not the least,  
The dream begins with them.



- Indu Malik, TZH

## Try

If you cannot come first,  
Try not to come last.  
If nobody is with you,  
Try to take someone with you.  
If nobody trusts you,  
Be confident.  
If you can't rise up,  
Try not to fall down.  
If you are not the best,  
Try not to be worse.

- Anjali Mishra, TZH



## The Girl Looks Back

The girl looks back  
To the time of her childhood.  
When she was epitome of innocence  
And the world beneath her feet.  
The girl looks back to her teens  
When she was sassy , charming  
And falling for herself.  
The girl looks back to her  
adulthood  
When she was mature  
And became independent.  
Now she looks back to her  
golden days  
When she had found her soul  
mate  
And the waves of emotion flow  
through her.



The girl looks back to her bad times  
When she and her baby were all alone.  
Who was supposed to be her soul mate,  
Was not anymore..

Today the girl is now a mother  
Prays for her angel  
“May my daughter have all the happiness of world.”

- Indu Malik, TZH



# Science or No Science



Life would have been more beautiful

If no apple had fallen and Mr. Curie  
hadn't had a wife...

How beautiful it would have been

With no theories to mug up, no prob-  
lems to be solved...

But at the same time life would have been so boring

If Graham Bell wasn't born, how would I talk to my friends...?

If there weren't any Edison, Franklin, Einstein

Our minds would have been filled with how and why.

Finally I decided.

It would be better if I stop thinking or wondering which is  
better....

Science or no science.

- Anjali Mishra, TZH

# A True Friend



A true friend never walks away  
But always stays.

A true friend looks out for you  
And keep your secrets like a precious  
gift.

A true friend always support you  
Making us believe that these arms are  
open for you.

A true friend will try and make you  
smile

When you are out of joy.  
Maybe this friend is not with you now,  
But will always be there in your heart.  
Close your eyes and ask yourself a  
question

"Have I ever been a true friend"?

- Indu Malik, TZH

49 Climatic changes and freaky weather patterns have been debated in several circles, both public and private. After all, the weather touches each and everyone of our lives. Forget Global warming, El Nino, Nina and such other vagaries. Let us just learn to enjoy the weather as it goes through a cycle of seasons year after year. So here is a poem as an ode to the weather

# WEATHER FAIR, WEATHER UNFAIR

It is the plight,  
Of Delhiites  
To face it seems,  
Weather extremes  
The thermometer;  
The barometer;  
The anemometer  
And hygrometer  
Span their scale  
Through heat and hail

As the meteorologists proceed,  
Forecasting the weather to succeed  
Delhiites pay a price  
For the season's caprice –  
Cottons, synthetics and silks  
Woolens, rugs and quilts  
Must succeed one another,  
Each according to weather

The heat of summer  
Sends you reeling  
Yearning for water,  
What a feeling!  
Heat and dust,  
Sweat and thirst  
Unbearable,  
Unquenchable!

Ends this pain  
With the shower of rain;  
Welcomed with pleasure

This change in weather  
A wonderful sight –  
This farmer's delight!  
Everything washed clean  
All bright and green  
Autumn's the weather fair  
Short-lived, so unfair!  
Yet filled it is  
With gaieties and festivities

Comes the winter  
What a shiver!  
Despite the sweater,  
Teeth a-chatter!  
Seeking solace  
In the cozy embrace  
Of soft quilts and rugs  
And coffee by the mugs

Up as the mercury begins to swing,  
There appears a brief spring  
Short but sweet  
This floral treat  
Balmy breeze  
Butterflies and bees  
The heavenly fragrance  
And colorful radiance  
Will soon be memory  
In mind's treasury  
For after spring remem-  
ber

It's summer again  
Short-lived pleasure  
Then long-lasting pain  
In each one's life, so too –  
Joys and jubilation so few  
Sorrows and tribulations so many  
Long cloudy times, some sunny  
Neither lasts forever  
Just as the changing weather  
For you cannot wish to tether  
Forever, fair weather  
A good that lasts forever;  
You neither cherish nor treasure  
For has there ever been gain  
Altogether without pain?

- Ms. Ramaa Sinha





# Au Revoir, Giri Sir

When you were here,  
There was pleasure everywhere.

But as you are leaving ,  
You will be deeply missed.

Your every thought,  
Made us fill with joy  
And dance like stupid toys.  
Thinking of your leaving,  
There is no joy..only sorrow.

Now as you are taking a new  
path,

We wish you success and joy  
in your every start and end.

Wherever you are going,  
We are all gonna miss you a lot  
from the core of our hearts.

*- Anjali Mishra & Indu Malik, TZH*



*Courtesy Dr. P. Jayaraj*

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## Dear Giri Sir

Being a student, the first thing you look forward to while taking admission in an institute, after its reputation, is its faculty. The word 'teacher' holds great meanings

within itself; dedication, hardwork, inspiration - the list is never ending.

When we think of you sir, all the synonyms of the word 'teacher' seem to fall in their appropriate places; an epitome of dedication, hardwork, patience, sincerity, a true idol, an inspiration, a pathfinder, a mentor, a guide, a motivator and above all, always calm and composed.

You are gem of a person, cuteness personified and fondly called the 'dude' of our Zoology department. Though it was tough to describe you in words we really wanted to pay you our tribute for all your love and blessings.

Most people might not be knowing that you took a long way to get where you stand today, completing your higher education without much support from family, getting a doctorate from BHU, losing your father during the time you needed his blessings the most, and still not letting the circumstances shatter you, getting up and making your dreams come true is something that every one of us cannot think of achieving.

You are a true star for us and we are blessed to have a mentor like you. You are retiring but it's definitely not an end. You will be loved and missed more than ever before. May god always keep you healthy and your smile never fade away and you keep enlightening the path of all the students who come your way, as always..

Love you sir!!



*Courtesy Himanshu & Sameeksha*





The Zoology Department has been participating and motivating students in the field of research. Funding agencies like Department of Biotechnology (DBT) and Delhi University are supporting the projects by providing funds at undergraduate level with their latest innovative schemes. Other faculty members of the department are also involved in independent projects. A brief view about the projects is mentioned below.

Delhi University has sanctioned 9 projects under the DU Innovative Scheme. Out of these, the zoology department is involved in three of the projects.

### SVC - 202

The present study is conceived with hypothesis that circadian variations do exist in terms of concentration and/ or composition of secondary metabolites in the medicinal plants, commonly used by us. And if so, exact time in a diurnal cycle can be elucidated when the active compounds from these medicinal plants should be extracted efficiently. HPLC fingerprints are being generated in order to test the above hypothesis. This project involved the guidance of Dr. Sudhir Verma and Dr. Om Prakash, along with two students, Ashmita and Himanshu from Zoology Department.



### SVC - 206

This team is working on sebaceous gland carcinoma (SBC) occurring at ocular and non ocular sites. Peroxisome proliferator-activated receptors (PPARs) are members of the nuclear hormone receptor family. Cyclooxygenase-2 (COX-2) overexpression has been shown in many neoplastic and pre-neoplastic lesions including skin cancer suggesting an important role of COX-2 in tumor development and progression. Histopathologically most of the cases in our study were well differentiated. The aim is to study the role of proliferator activated receptors PPAR- $\gamma$ , PPAR- $\rho$  and cyclooxygenase (Cox)-2 in eyelid SBC. Principal investigators are Dr. P. Jayaraj, Dr. P. S. Dhanaraj, Dr. Mansi Verma and students involved are Sameeksha, Tanaya, Rhythm and Christeena, from zoology department.



## Contributions to Research

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### SVC - 208



The aim of this project is to work on the natural products like coumarines and chalcone studying their biological activities, including anticancer properties. Traditional literature as well as recent evidence are studied to

design a class of compounds which could be potentially more effective in cancer treatment. The principal investigators of the project are Dr. Rajendra Phartyal and the students involved are Bornika and Sandhya from zoology department.

Other Departments are also involved in the projects mentioned above.

### Independent Projects of Other Faculty Members of Zoology Department

Dr. Vartika Mathur - She is working in establishing the association between active and passive plant responses induced by pathogens and herbivores.

Dr. Om Prakash - He is working on developing assays for rapid detection of bacterial diseases in common Indian fishes. Natural products are used to study the immune response. Due to increasing demands of fishes there are problems regarding aquacultures that this project aims at by improving its culture.

### Following are the projects sanctioned by Department of Biotechnology

Dr. Om Prakash - Improve the aquaculture yield of African catfish, *Clarias gariepinus* by boosting the immune response through feed supplementation. .

Dr. P. S. Dhanaraj and Dr. Mansi Verma - Cloning of catabolic genes known to have potential to degrade persistent pesticides.

Dr. Ajaib Singh - Isolation of biotechnologically important bacteria from polluted water resources.

Dr. Sudhir Verma - Comparative analysis of 'thiol group concentration' in human head hair proteins of Delhi population – A case study



# Academic Year 2012-2013

## Third Year



Avantika Ghosh  
1st DU/1st SVC  
DU Gold Medallist



Garima Arora  
2nd SVC



Goldy Yadav  
3rd SVC

## Second Year



Anjali Mishra  
3rd DU/1st SVC



Indu Malik  
2nd UDSC/2nd  
SVC



Neha Chauhan  
2nd UDSC/2nd  
SVC



Swarnabha Sarkar  
3rd SVC

## First Year



Pooja Mittal  
1st DU/1st SVC



Tanaya Bhattacharya  
2nd SVC



Alice Sinha  
3rd SVC

# Academic Achievements

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## Gulshan Singh (Third Year Zoology)



1. Founder of 'Bakait Entertainment' with his friend Atul Puri.
2. Filmed "Perception" - screened at antardhwani 2013, received accolades and praised by VC of DU.
3. Directed "Shine of Gold" - official college documentary of SVC.

4. Filmed "Tigers of the Sky" - a research documentary on black kites of Delhi by Wildlife Institute of India, Dehradun.

Circulated to the Oxford University, University of Chicago, Spanish National Research Council, Spain & Wildlife Institute of India, Dehradun.

## Ayush Puri (Third Year Zoology)

1. Executive member for parivartan (social service society of SVC)
2. Campaign Leader for Teach For India.
3. Volunteer for Prayas and Friends organization



## Rahul Tomar (Second Year Zoology)

1. College Games - 400m, 800m, Relay-Silver medal
2. IIT sportspack-800m-Bronze
3. State athletics championships-800m-8th position
4. Intercollege-800m-7th position
5. National Participation-800m-8th position
6. College athletics team captain
7. Delhi Zoo volunteer



# Extracurricular Activities



# Trip to Kolad

Down Memory Lane



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# TTD Exchange Program





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# Teacher's Day '13



# 61 Sarath Chandran Memorial Lecture



# Antardhvani Innovation Plaza





# Our Professors - Forever Young!



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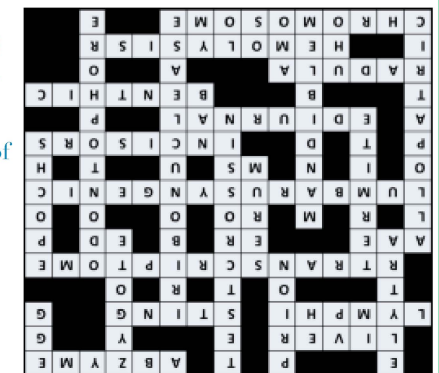
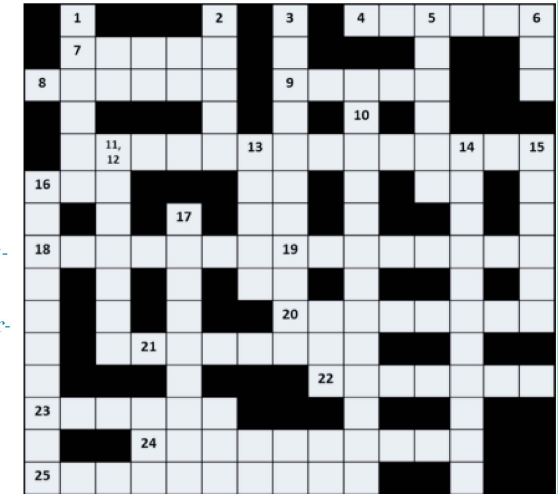
## Crossword

### Up to Down

1. Thickened horny fore-wings of beetles that cover and protect membranous hind-wings (6)
2. Unusual infectious agents which are purely proteinaceous ((5)
3. Genetic cross between a double heterozygote and a double homozygote (4+5)
5. Cell resulting from fusion of gametes during meiosis (6)
6. Term used to denote an ovum, with yolk and surrounding membranes (3)
12. Commonly called as white ant (7)
13. Fluid that separates out from clotting blood (5)

### Left to Right

4. Antibody with catalytic activities (6)
7. An accessory gland of digestive system which helps in lipid emulsification (5)
8. Circulating fluid, collected from interstitial fluid and emptied to subclavian veins (5)
9. Anatomical structures used by insects for feeding or defense (5)
10. Nucleases that catalyze RNA degradation (12)
11. Overall transcribed portion of genome in a cell (13)
18. Type of vertebrae between thoracic vertebrae and sacral spine (6)
19. Term used for denoting genetically identical and immunologically compatible individuals (8)
20. Front teeth in heterodont dentitions (8)
21. Any pattern recurring on daily basis (7)
22. Ecological region at the lowest level of an ocean (7)
23. Toothed anatomical structure in mollusks, used for feeding (6)
24. Process of lysis of erythrocytes, leading to release of its content (9)
25. The most packaged form of DNA in a eukaryotic cell (10)



By Dr. Sudhir Verma

Revisiting by Bhavya Iyer, SVM



# The Phoenix

Once I wondered, “ where is the place to spend  
eternity”?

Then I realized the living beauty of science.  
Eventually I found the world of species and genus  
living and breathing with them ;

But there was something which was lurking and  
knocking  
that remain unsolved...

Still with teacher's support and rapport  
Has found the answer  
peeping into it, there is a spark of love  
And their contribution is pure as dove;  
Hence I realized the real purpose of being here  
which is yet to evolve :

Expecting dynamic changes with a strong believe  
And walking together in the path of success  
whose destiny is defined by our effort and  
determination

conscience will thus bless us and so will our work!!

Born again like a phoenix bird  
in a new world!



- Tonirash