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EDITORIAL

TALE OF GOLDEN THREAD

ZOOLOGIA

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ZOMBIE FUNGUS

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EELS AND BATTERIES

XENODACTYLUS: THE LIVING ROBOTS



THE DOLPHIN CONNECTION

Out and About

WINGSUIT

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BIONMIRY



DOG'S NOSE KNOWS



KINGFISHER'S BEAK

NEUROMORPHIC TIPS - THE FUTURE OF BIRDS



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DEPARTMENT OF ZOOLOGY

EDITORIAL

TALL

When you hear the word Zoology, what comes to mind? Perhaps the study of animal biology and behavior, wildlife conservation, or analyzing the ecological relationship between animals and their environment. But have you ever considered how animals and zoology impact our daily lives? While it may not be immediately apparent, zoology has made significant contributions to the modern world.

From the keychains, toys, and phone batteries we use to the buildings and bridges we encounter everyday, animals have inspired scientists from various fields to develop innovative solutions to modern-day problems. Zoology is the key to translating these natural wonders into practical products and methods.

Animals have been evolving for billions of years, gaining valuable experiences from their harsh environments, adapting and surviving. Understanding how they do this can help us solve complex problems with an experience equal to billions of years. Zoology provides us with the knowledge and tools to harness the power of nature and apply it to our daily lives.

In conclusion, Zoology is not just about studying animals but it is also about understanding how they can benefit us. By studying the natural world, we can develop new technologies and methods that can improve our lives and the world around us. Zoology is a fascinating field that has the potential to make a significant impact on our future.

TALE OF GOLDEN THREAD

The entire world was in shock, as the Victoria and Albert Museum showcased an unseen, unexpected & unbelievable sight of the golden textile. This Golden spider silk was glowing like real gold under the sunlight.

The fact that shocked the audience more was that the textile was indeed made from silk threads painstakingly harvested from more than a million female Golden orb-weaver spiders by a large team in the highlands of Madagascar in a three-year project. The spider species is under the genus *Nephila*.

The importance of Zoology in the textile industry has been known to humans since the discovery of silk in China. Silk obtained from a new species under Lepidoptera has become immensely popular around the world. But now, with the introduction of spider silk, the impact of Zoology in textile industries becomes more prominent.

Apart from exquisite quality and vibrant colour, spider silk is regarded as the toughest fibre found in nature and can be used to make bulletproof vests.



Owl and Aeroplane

Nature has always been an inspiration for engineers and scientists, and so owls are no exception. The unique wing structure of owls has inspired the development of quieter and more efficient wings for airplanes.

Studies have shown that airplane noise has a significant impact on surrounding communities, with negative impacts or ill effects on health and quality of life. The feathers on an owl's wings have a unique structure that allows them to fly silently through the air. The edges of the feathers have fringes that help to break up the air turbulence, reducing the noise created during flight. By implementing this design, in airplane wings, we can reduce noise pollution by up to 30%. The unique structure of owl wings also helps them to fly more efficiently. The feathers have a serrated edge that allows air to flow smoothly over the wing, reducing drag and increasing lift. This inspired the development of airplane wings with a similar structure, which has led to fuel increase and reduced carbon emissions. Studies have shown that implementing this design in airplane wings can reduce fuel consumption up to 10%. The application of owl-inspired wing design has had an impact on aviation industry, leading to quieter and more efficient airplanes.

WINGSUIT

The flying squirrel's influence wingsuits are undoubtedly one of the most thrilling pieces of apparel in the world of extreme sports. These suits allow adventures to soar through the air like birds, experiencing the rush of adrenaline that comes with the freedom of flight. Interestingly, the design of these suits was inspired by none other than the humble flying squirrel.

In the late 1990s, French skydiver Patrick de Graydon created the first wingsuits. He was inspired by the flight abilities of birds & flying squirrels, & he set out to develop a suit that would allow humans to mimic these creatures' gliding ability. The wingsuits consists of a fitted suit with fabric members between the arms and legs, which creates lift, much like the wings of a bird or the patagium of a flying squirrel.

Flying squirrels have a patagium, a fold of skin that extends from their legs to their sides, allowing them to glide for long distances with precision and control. These incredible creatures served as the inspiration for the wingsuit design and continue to be source of inspiration for new developments. The importance of the flying squirrel in the development of wingsuit cannot be overstated. These suits are a statement of testament to the power of biomimicry, the study of nature to create sustainable solutions for human problems. Flying squirrel's gliding abilities demonstrate how nature's design solutions can inspire innovation and progress, pushing the boundaries of human flight.

EELS AND BATTERIES?

In 1799, Italian scientist Alessandro Volta created a revolutionary invention that would change the world forever. He fashioned an arm-long stack of zinc and copper discs separated by salt-soaked cardboard, which he called the "voltaic pile". This was the world's first synthetic battery, and it was based on an ancient source of inspiration - the electric eel. The electric eel is a fascinating creature that has the ability to generate its own electricity. Its electric organ makes up 80 percent of its two-meter length & contains thousands of specialised muscle cells called electrocytes. Each electrocyte produces a small voltage, but when combined,

they can generate up to 600 volts - enough to stun a human or even a horse. Volta was inspired by the electric eel's unique abilities and used them to create his battery, which turned him into a 19th century celebrity.

Today, researchers from the University of Fribourg have taken inspiration from the electric eel to create a new generation of batteries. These batteries are made out of gels arranged in the electrocytes in the electric eel's electric organ. This ingenious design will lead to the development of batteries that compatible with soft-bodied robots, pacemakers, prosthetics, and medical implants.

KINGFISHER'S BEAK

Land of the rising sun, Japan again thrilled the world with their latest invention of bullet train in early 90's. The unusually brilliant idea of the Shinkansen bullet train was hailed as a success. But this victory would not be celebrated without the concept of biomimicry.

Eji Nakatsu, the manager of the engineering team for the Shinkansen bullet train, was an avid bird watcher and an active member of Japan's Wild Bird Society. He was tasked with solving the tunnel sonic boom due to changing air resistance suffered by the train while coming out of a tunnel. Nakatsu, almost naturally drew inspiration from Kingfisher as it can shift from a region of low air pressure to higher one without a splash. The ideal shape of Shinkansen's head was designed as a Kingfisher's beak to overcome the air resistance. The theory worked and not only the tunnel sonic boom vanished but also fuel consumption decreased significantly. Shinkansen is a flawless example of application of Zoology in technical fields.

NEUROMORPHIC CHIPS - THE FUTURE OF COMPUTING

Neuromorphic chips are the latest development in computing, and they are changing the game. Unlike traditional CPUs, neuromorphic chips mimic the structure and function of the human brain. This allows them to process information in a way that is more similar to the way our brains work with increased speed and efficiency.

Conventional CPUs rely on a serial processing model, where data is processed one piece at a time. Neuromorphic chips, on the other hand, use a parallel processing model, where many pieces of information can be processed immediately or simultaneously. This allows for faster and more efficient processing, with lower energy consumption.

Neuromorphic chips are already being used in a variety of applications, from image and speech recognition to autonomous vehicles and robots. As researchers continue to develop and refine these chips, the possibilities for their use are endless.

The development of neuromorphic chips represents a major step forward in the world of computing. By mimicking the structure and function of the human brain, scientists are unlocking new levels of efficiency and power in our technology. The future is bright for neuromorphic computing, and we are excited to see where it will take us.


Lab rats have been instrumental in the field of biology, serving as subjects in countless scientific experiments. Their contribution to the scientific community is immeasurable, yet often overlooked. It is crucial to acknowledge the tremendous impact that these animals have had on advancing our understanding of the world around us. Many of these rats live in laboratories, where their lives are filled with uncertainty and discomfort. They are subjected to countless experiments, often without understanding the reason behind them. Despite the pain and uncertainty, these animals continue to play a critical role in scientific discovery.

The knowledge gained from the participation of lab rats in research has led to better treatments for diseases and has helped us understand the complex workings of the human body. Through their willingness to endure countless experiments, these animals have paved the way for significant scientific advancements that have improved the lives of countless people.

Although their lives may be brief, the legacy of these rats will live on forever in the scientific community. Their contribution has been critical in advancing our understanding of biology and the discoveries made possible by their participation will continue to impact the future generations.


It is essential to recognise the tremendous sacrifice made by these animals in the name of scientific discovery. We must honour their contribution and continue our work in a way that acknowledges their importance and the immeasurable value of their sacrifice. Lab rats have played a significant role in advancing our understanding of the world around us. Let us remember the invaluable role that these animals have played in scientific research and honour their legacy by continuing to push the boundaries of scientific discovery.

ZOMBIE FUNGUS



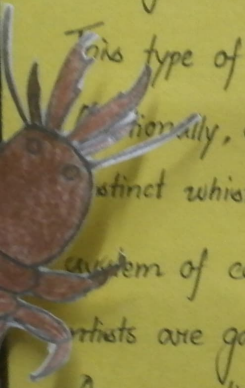
Cordyceps fungus is a remarkable example of nature's ability to manipulate and control living organisms. When a spore of the fungus lands on an ant, it will begin to grow inside the ant, consuming it from the inside the out. As the fungus grows, it releases chemicals that affect the ant's behavior, causing it to climb to a higher location before dying. This strategic location allows the fungus to release its spores into the air, increasing the chances of infecting ants.

This phenomenon has been documented in several species of ants, as well as other insects such as beetles and moths. The unique properties of *Cordyceps* fungus have caught the attention of researchers in fields such as medicine and agriculture, as the fungus is known to produce a variety of bioactive compounds that may have potential therapeutic uses. Furthermore, the study of *Cordyceps* fungus and its interaction with its hosts has provided valuable insights into the evolution of parasitic and mutualistic relationships in nature. Overall, *Cordyceps* fungus is a fascinating and complex organism that continues to intrigue & inspire scientists across various disciplines.

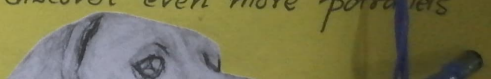


THE DOLPHIN CONNECTION

Dolphins are some of the most intelligent creatures in the ocean. They are known for their complex social behavior and ability to work together in groups to accomplish tasks. Scientists have been studying dolphins to learn more about their herd behavior and social skills, & they have made some fascinating discoveries. One of the most interesting findings is how dolphin social behavior may have parallels to the development of human culture. For example, dolphins have been observed teaching their young how to use tools, such as using sponges to protect their beaks while foraging.



This type of learning & passing down of knowledge is similar to how human cultures develop & evolve. Additionally, dolphins have their own unique communication system, with each individual having a distinct whistle. They also use body language & touch to communicate with one another. This complex system of communication is also similar to human language. By studying dolphin behavior, scientists are gaining insights into how complex social behavior & culture may have evolved in humans. As we continue to learn more about these incredible creatures, we may discover even more parallels between dolphin and human behavior.



DOG'S NOSE KNOWS



Man's best friend is proving to be more than just a loyal companion. Dogs have an exceptional sense of smell that has been utilized in a variety of fields, including law enforcement and search & rescue operations. But recent studies have shown that dogs can also detect the presence of cancer cells in human bodies through their sense of smell. Trained medical detection dogs have been able to accurately detect cancers such as lung, ovarian, & prostate cancers just by smelling the patient's breath or urine samples. This is due to the volatile organic compounds (VOCs) that are emitted by cancer cells, which dogs are able to detect even in the earliest stages of the disease. This breakthrough could lead to earlier detection of cancer, saving lives & increasing the success of treatment. With their remarkable sense of smell, dogs continue to show their immense value in the field of medical research.

BROWN BEARS TREAT DIABETES?

Brown bears, known for their massive size and ferocity, may hold the key to treating diabetes. Scientists have found that the animals can enter a state of hibernation for months, without suffering muscle atrophy, bone loss or insulin resistance. They do this by recycling their own urine, reducing their body temperature and suppressing their metabolism. Researchers are studying their process to learn how to induce a similar state in humans, which could lead to a breakthrough in diabetes treatment. In hibernation, bears produce a protein called "Trehalose" which acts as an anti-inflammatory agent and could be used in medicine to treat diabetes. Brown bears are one of the most ancient animals on earth and have evolved to survive in some of the harshest environments. Their unique physiology has the potential to revolutionize medical science and pave the way for new treatments for diabetes.

PASSIVE COOLING

Architecture inspired by nature is not a new concept, but in recent years, the idea has gained traction. One great inspiration is termite mounds, which led to the creation of sustainable buildings. The most famous of these buildings is the Eastgate Centre in Zimbabwe. Designed by architect Mick Pearce, the Eastgate Centre is an office & shopping complex that was completed in 1996. The building uses a passive cooling system based on the structure of a termite mound. The system circulates air through the building, which cools it down during the day and releases the heat at night. This system is so efficient that it saves 90% of the energy costs compared to a traditional air-conditioned building.

The design of the Eastgate Centre is just one example of how termite mounds have inspired architects to create sustainable buildings. Termite mounds maintain a consistent temperature throughout the day, despite the heat outside. They do this by using a system of vents & tunnels that circulate air, which inspired architects to create buildings with natural ventilation.

The termite mound has inspired architects to create sustainable buildings that use natural cooling and ventilation systems. The Eastgate Centre in Zimbabwe is a shining example of this idea, with its passive cooling system saving 90% of the energy costs compared to traditional buildings. As we continue to look for ways to reduce our carbon footprint, it's inspiring to see how nature's design can be used to create sustainable solutions in architecture.



XENOBOTS: THE LIVING ROBOTS



Xenobots are tiny robots made from the cells of African clawed frogs, and they are changing the way we think about robotics and biology. These machines were inspired by the way that frog embryos self-organize into complex shapes, leading to the creation of the first-ever living robots.

Researchers from the University of Vermont and Tufts University began their work by collecting stem cells from frog embryos and allowing them to develop into skin and heart cells. The cells were then assembled into a variety of shapes using computer algorithms, resulting in the creation of the first-ever xenobots.

These living robots are capable of movement and can even heal themselves when damaged. They have the potential to be used in a variety of applications, from drug delivery to environmental cleanup.

The inspiration for the xenobots came from the way that frog embryos self-organize into complex shapes, allowing researchers to create machines that are not only alive but also capable of complex behaviours. This research is a reminder that nature can be a powerful source of inspiration and innovation, and that studying living organisms can lead to breakthroughs in a variety of fields.

BIOMIMICRY



Nature has been perfecting its designs for billions of years, and only recently have humans begun to tap into its vast knowledge to create innovative solutions for our world's challenges. Biomimicry is a fascinating field of study that draws inspiration from the natural world to create sustainable and efficient solutions for various problems.

The term biomimicry was coined by Janine Benyus in her 1997 book *Biomimicry: Innovation inspired by Nature*. Benyus, a natural sciences writer, noticed that many of the problems humans were trying to solve had already been solved by nature through millions of years of evolution.

Moreover, biomimicry can help us address some of the world's biggest challenges. Scientists are looking to develop materials inspired by spider silk for use in bulletproof vests, and researchers are studying gecko feet to create better adhesives that can be used in everything from clothing to industrial applications.

Biomimicry is an exciting and innovative field that holds tremendous potential for the future. By looking to nature for inspiration, we can create sustainable and efficient solutions to our world's problems. Whether you're a scientist, engineer, architect, or anyone else interested in innovation, biomimicry has something to offer. It is a promising approach that can help us build a better world for ourselves and future generations.