Biomimicry - Copying of The Nature

Dr Kumari Thilakaratne & Mr Umal Kuruppu

If I ask you "how would you reach the ground safely from the sky?" you would certainly say "By using a parachute, isn't it?". However, did you know that a gently swinging and falling cactus flower inspired mankind to solve that problem?

Comparing the products that have contributed to the developments in the field of technology, Nature's products - such as plants and creatures - are significantly advanced in their own aspects. Scientists have now admitted that the best way to find answers for our problems is by "studying nature". This unveiling of micro secrets in nature to produce new creations is called "Bio Mimicry".

For example, take the sky. An aeroplane that can fly higher than a bird can be compared to a giant student learning from a tiny bird teacher. Designers have utilized the shapes of the body, head, chest and the unique shape of wings of birds to design aircrafts.

Although an aeroplane can fly higher, it cannot remain stationary in the sky. When people questioned nature as to how this happen, the answer came from the dragonfly. People observed that the motion of the dragonfly's wings helped it to stay in one place, and they blended that secret to the helicopter. Taking one step ahead, the latest aim of scientists at the Florida University is to study the flight of insects to develop an aircraft, smaller than six inches, which can be used in warfare.

Another development is the new walking stick that has been developed using a bat's radar communication techniques. This has helped people with impaired vision to detect obstacles on roads, by informing the user well in advance using RADAR technology.

VELCRO tape is one of the oldest examples of Bio Mimicry. VELCRO tapes are common in things that we use daily, like clothes and bags, and it is designed by studying the seeds of sticky grass? or saramenia aleynia? and NAGADARANA. Though people see these seeds as a nuisance, Mr. George Mistral founded a business worth millions in 1951, simply by observing the seeds clinging to his dog's fur. He studied how the tiny hooks of these seeds cling to fur, fabric and leather.

Japanese scientists studied the ability of butterflies to change the colour of their wings and developed surfaces similar to them. It is another amazing creation of nanotechnology. It is not simply a painted surface, but one which is capable of changing colours by manipulating the direction of light reflection.

Though not yet seen in our country, you may have observed it in the media - the high speed electric trains (SHINKANSEN or Bullet Train) that are commonly used in countries such as China and Japan. During the era of

development of these trains, the greatest problem that engineers faced was the tremendous noise generated by the compression of air while passing through the tunnels. Can you believe that the engineers found the solution to this problem by observing the kingfisher? The unique shape of its beak allows it to move quietly through air as well as in water to hunt fish. Discovering this phenomenon, Japanese scientists produced the head of Shinkansen train in the shape of kingfisher's beak. This provided a perfect answer to the problem. As an unexpected advantage, it added 15% power saving and 10% extra speed.

We have learnt even more interesting lessons from the dwarf termite. This is not about their unity, but the nest. The dwarf termite is capable of creating architectural air vents to keep their nests cool. Inlet vents are made at lower levels allow to cool air in, and outlet vents are set at higher levels to allow warm air to rise by convection and escape. People have utilized the secret of dwarf termites to build mega buildings. You shouldn't be surprised if we call them "termite nests".

There are many things to learn from the behaviour of small insects such as cockroaches. Famous scientists study them because of the possibility of developing technological concepts using such studies. The glass sponge is a creature that lives in deep seas. It is made of a combination of weak chemical components but has a strong skeleton. Some might be troubled by the dwelling of pond skaters on the surface of water and another might be puzzled by the contribution of a shark's rough skin to its speed. Scientists are keen to investigate the secrets behind these phenomena because their curiosity may result in a new item of technology in the future.
Mother Nature is the creator of this amazing world. From the beginning of this world nature has endeavoured to find the most suitable and efficient answers, and the results are still visible today. Can mankind ever challenge her?

These are few examples out of the thousands of Bio Mimicry applications that have been brought to your attention, because you may also be able of contribute valuable ideas to developing new technologies.

Practise and train yourselves to observe nature with curiosity. It is certain that you will also be able to develop new concepts that would facilitate development of new technologies.

Dr Kumari Thilakaratne &
Mr Umal Kuruppu
Science Dissemination Unit
Institute of Fundamental Studies
Hantana Road, Kandy