



Promoting Scientific Development

Development today is a wise blend of science, technology, and management. This assures both scientific and sustainable development. The Trinity SciTech-&Mgmt Expo accordingly aims at motivating students by promoting science and enhancing innovation keeping in mind societal and national needs.

Nepal is assuredly a country of possibility. Immense untapped natural resources and a vast workforce promise great socioeconomic success in the future. A developmental approach incorporating a fusion of SciTech and Management is essential to face challenges and threats. Climate change is a reality here: . . . Glaciers are receding, Rains are unpredictable, and summers are hotter. Pollution imperils the desirable healthy lifestyles of the people in our cities. Natural disasters occasionally plague us. Even our economy needs to do far better, cutting down on debt and dependence, with all its huge foreign remittances.

What do we need? Overall, our strategy should emphasize working collaboratively, developing tools, and managing goals. Further, we need to build a new work culture attuned to growth and an environment where creativity and intelligence are highly valued and where individual talent is fostered. We'd need to go in for high-tech industries alongside vastly improving our infrastructure, especially the road and railway network. Managing our water resources is vital as it is directly linked to clean energy production. Above all, the Nepalese, particularly students, have to be made aware of the vast soft-power of such blended learning, the importance of exploring knowledge and the need to improve upon traditions and cultures in science and management.

This Expo focuses on the appreciation of the breadth and depth of scientific knowledge applicable to management practice. It feels that it must highlight the importance of science alongside engineering and their relevance to students' lives. It believes that practice needs to be based on science-based management and leadership as well as the collaboration between managers and scientists. It also holds that decision-making should be informed, and information must be based on the best available knowledge. It wishes to make a commitment to growth: *Tomorrow will not be like today or yesterday!*

Celebrating science and the achievements of college students through such youth programmes not only helps to promote science but can also be highly motivating for the students involved. Capturing the imagination of young people in science through creativity-rich activities would eventually help to develop the country. Perhaps, Nepal ought to aim to achieve such economic growth that it becomes a "Start-up nation". We firmly hold that while our country has much to learn from the world, the world one day may have much to learn from Nepal if we develop our system intelligently and conserve our environment properly . . .

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Science and Technology in Society

Prof Dr Bharat Raj Pahari

It was indeed fun for me during my childhood to watch the silent and calm waters of Fewa lake. After a while, though, I used to become distracted and find flat stones to throw them skillfully across the surface of the lake for multiple jumps. It was like seeing flying fish. Often, I enjoyed doing this with my friends. I also remember when I first started swimming at the age of seven. We had our playground near the lake. On returning from school my friends used to go to play "football" with a rubber ball! After the game was over, they normally went to swim in Fewa lake. One nice day I just could not stop myself to go swimming in the lake. The first time in water was not easy and I nearly suffocated. Soon, I learned not just swimming but floating on water. Even at that age, I wanted to know the scientific reasons behind the multiple jumps of those flat stones and my floating, and drifting, on water. This curiosity is still alive within me and I realize, ever so often, new scientific reasoning that explains some so-called mystery or the other. Facts emerge through questioning and make it easy to understand reality . . .

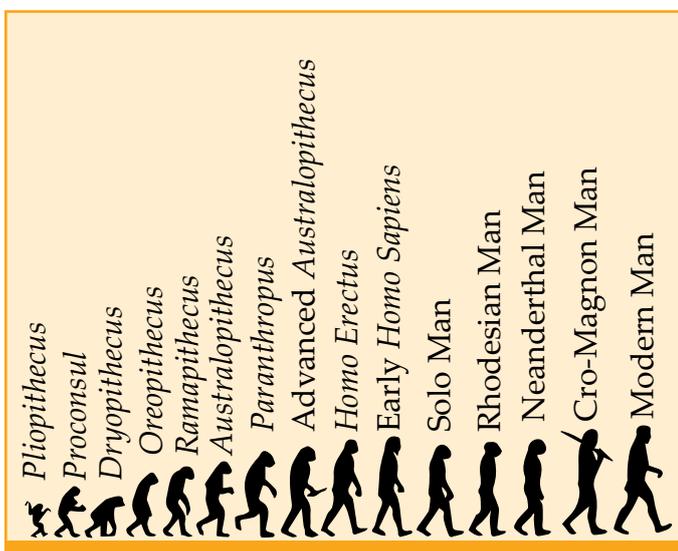


stone weapons were used about 4 million years back! Whatever, the use of stone tools is considered as a fundamental achievement in human development. Scholars claim that it was only about 12,000 years back that humans started staying in one place and this was when agriculture began. The transfer from hunting to agriculture state marked the beginning of modern civilization.

Looking back at the evolutionary process, we find that the weapons used during the hunting age and thereafter ensured the survival of mankind. The acquisition of needed skills and knowledge of the processes of developing new ways of life for agriculture alongside the invention of alternatives are the evidence for early science and technology.

It is a well-understood fact that making a stone weapon needs a special skill. Furthermore, using this weapon in hunting animals is yet another skill. The focus required and the way of throwing this weapon and then getting hold of the targeted animal obviously demands special abilities. This is actually the beginning of technology. Human beings went on developing technology through innovation. In the course of time, man began finding facts behind nearly every event or happening or element in his surroundings. The description of such events, happenings, and elements and supporting it with facts is what we understand as science. Therefore, understanding of facts is science and the process of using these facts for the benefit of mankind is technology. In other words, it can be said that science describes and technology follows this description to produce the product that makes life secure and comfortable.

The moment man first picked up a stone or a branch to use as a tool, he irrevocably altered the balance between himself and his environment. From this point onwards, the world around him changed. It was no longer regular or predictable. New objects appeared that were not recognizable as a mutation of something that had existed before, and as each one emerged it altered the environment not for a season but forever. While the tools were few, their effects took a long time to spread and to cause change. But as they increased, so did their effects: the more the tools, the faster the rate of change. Furthermore, and significantly, it is also true that science and technology shapes human conscience. It broadens the horizon of our sense of what is right or wrong. This is a fundamental aspect of human civilization. It has triggered the process of change.



In the course of time, even revolutionary change has taken place in society due to great technological achievements.

Great achievements are instrumental in the development of modern human civilization as they have the greatest impact on the quality of life. Some of these include:

High Performance Materials: From the building blocks of iron and steel to the latest advances in polymers, ceramics, and composites, the 20th century has seen a revolution in materials. Engineers have tailored and enhanced material properties for use in thousands of applications.

Nuclear Technologies: The harnessing of the atom changed the nature of war forever and astounded the world with its awesome power. Nuclear technologies also gave us a new source of electric power and new capabilities in medical research and imaging.

Laser and Fiber Optics: Pulses of light from lasers are used in industrial tools, surgical devices, satellites, and other products. In communications, highly pure glass fibers now provide the infrastructure to carry information via laser-produced light, a revolutionary technical achievement. Today, a single fiber-optic cable can transmit tens of millions of phone calls, data files, and video images.

Petroleum and Gas Technologies: Petroleum has been a critical component of 20th century life, providing fuel for cars, homes, and industries. Petrochemicals are used in products ranging from aspirin to zippers. Spurred on by engineering advances in oil exploration and processing, petroleum products have had an enormous impact on world economies, people, and politics.

Health Technologies: Advances in 20th century medical technology have been astounding. Medical professionals now have an arsenal of diagnostic and treatment equipment at their disposal. Artificial organs, replacement joints, imaging technologies, and bio-materials are but a few of the engineered products that have improved the quality of life for millions of people and even animals.

Household Appliances: Engineering innovation has produced a wide variety of devices, including electric ranges, vacuum cleaners, dishwashers, and dryers. These products give us more free time, enable more people to work outside the home, and contribute significantly to our economy.

Imaging Technologies: From tiny atoms to distant galaxies, imaging technologies have expanded the reach of our vision. Probing the human body, mapping ocean floors, tracking weather patterns are all the result of engineering advances in imaging technologies.

Internet: The Internet is changing business practices, educational pursuits, and personal communications. By providing global access to news, commerce, and vast stores of information, the Internet brings people together globally while adding convenience and efficiency to our lives.

Space Exploration: From early test rockets to sophisticated satellites, human exploration of space is perhaps the most amazing engineering feat of the 20th century. The development of spacecraft has thrilled the world, expanded our knowledge base, and improved our capabilities. Thousands of useful products and services have resulted from space programs, including medical devices, improved weather forecasting, and wireless communications.

Air Conditioning and Refrigeration: Air conditioning and refrigeration has changed life immensely in the 20th century. Dozens of engineering innovations have made it possible to transport and store fresh foods for people who now live and work comfortably in sweltering climates, and to create stable environments for the sensitive components that underlie today's information-technology economy.

Telephone: The telephone is a cornerstone of modern life. Nearly instant connections - between friends, families, businesses, and nations - enable communications that enhance our lives, industries, and economies. With their remarkable innovations, engineers have brought us from copper wire technology to fiber optics, from switchboards to satellites, and from party lines to the Internet.

Computers: The computer has transformed businesses and lives around the world by increasing productivity and opening access to vast amounts of knowledge. Computers have relieved the drudgery of routine daily tasks, and brought new ways to handle complex ones. Engineering ingenuity fueled this revolution, and continues to make computers faster, more powerful, and more affordable.

Agricultural Mechanization: The machinery of farms - tractors, cultivators, and combines - dramatically increased farm efficiency and productivity in the 20th century. At the start of the century, four U.S. farmers could feed about ten people. By the end, with the help of engineering innovation, a single farmer could feed more than 100 people!

Radio and Television: Radio and television were major agents of social change in the 20th century, opening windows to other lives, to remote areas of the world, and to history in the making. From the wireless telegraph to today's advanced satellite systems, engineers have developed remarkable technologies that inform and entertain millions every day.

Electronics: Electronics provide the basis for countless innovations - CD players, TVs, and computers, to name a few. From vacuum tubes to transistors or integrated circuits, engineers have made electronics smaller, more powerful, and more efficient, paving the way for products that have improved the quality and convenience of modern life.

Electrification: Electrification empowers almost every pursuit and enterprise in modern society. It has literally lighted the world and impacted countless areas of daily life, including food production and processing, air conditioning and heating, refrigeration, entertainment, transportation, communication, health care, and computers. Thousands of engineers made it happen, with innovative work in fuel sources, power generating techniques, and transmission grids.

These achievements have had a strong impact on the human conscience. This has also created many complications. Owing to these complications, different kinds of conflicts are appearing and eventually giving birth to unrest and struggles in society. Repeatedly, we have witnessed terrorism, religious fanaticism, and racist polarization. Recent events in Nepal, such as racial and extremist voices in and outside the Constituent Assembly and resistance to regular business dealings, are other such manifestations.

All these facts inform us that science and technology has greatly shaped society. Therefore, the students of science should pay attention to societal phenomena since they have a vital role to perform in society. ■

The World of Flowers & The Flowers of the World

Dr Tirtha Bahadur Shrestha

Introduction

The world of flowers is full of wonders. However, a flower in its essence and purpose is nothing but organs of sex and reproduction. Scientists believe that flowers appeared through a series of evolutionary processes during the cretaceous period some 140 million years ago. It was an era when dinosaurs died out. The plants of the dinosaurs' era did not produce seeds the way our flowers do today. Botanists therefore classify the world of plants into two major groups, i.e. seed-plants (Phanerogams) and non-seed plants (Cryptogams) such as the ferns, mosses and mushrooms. Flowering plants which produce seeds that are enclosed in fruits are called Angiosperms such as peas and peanuts. Plants that produce naked seeds are called Gymnosperms such as the pines and junipers. It has been estimated that over 250,000 plant species are on record as Angiosperms meaning flowering plants. Of them, over 6,500 species occur in Nepal. This amounts to 2.6 percent of the global share. The share of the global terrestrial area for Nepal accounts to just 0.1 percent. The floral diversity of Nepal is therefore considered to be very rich. Besides, many species of flowering plants are not known to occur outside Nepal. They are endemic to Nepal. If we fail to conserve them or to develop them for human use, no other country will have that opportunity. Such plants include several rhododendrons, orchids, primroses, gentians, and poppies.

The structure

Flowers are structured in a way that their sex organs are properly displayed so that pollination and fertilization can easily take place in order to produce fruits and seeds for the survival of the next generation. A flower is said to be complete when it possesses the female reproductive organ Gynoecium and the male organ Androecium seated within

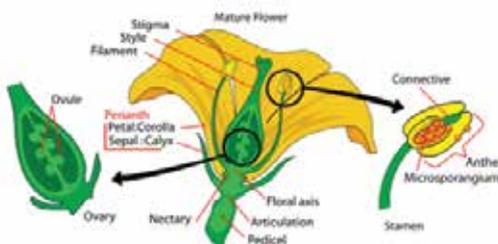


a whorl of decorative corolla (petals) surrounded by a supplementary whorl of calyx (sepals). A complete flower is thus a true representation of "Shiva Linga" where the phallus "Linga" rests on a uterus, the "Soma Sutra" or "Jalahari" as we see in the Pasupatinath temple. The concept of Satyam (truth), Shivam (divinity), and Sunderam (beauty) is best expressed in the natural manifestation of a flower. Even the smallest flower of the world, the Wolffia measuring

less than a millimeter, has an androecium and a gynoecium in its flowers. The world's largest flower, Rafflesia measuring about 90 centimeters, also possesses an androecium and a gynoecium within a whorl of corolla and calyx. The Shiva Ling as conceptualized by the followers of Hinduism is, therefore, a symbolic representation of a complete flower. Perhaps, no human culture has failed to recognize the virtues of a flower in depicting truth, divinity, and beauty.

The function

The function of a flower is not only to ensure a continued existence of its species but also to provide food to other living creatures of the ecosystem. Flowers, therefore, adapt themselves to their environment of living beings and non-living things (climate/soil/physiography). Their adaptation to ensure pollination, fertilization, seed bearing, and seed dispersal is rather remarkable. They design themselves to enhance cross-fertilization. A number of plant species such as maize have physically isolated male organs (androecium/stamens) and female organs (gynoecium/pistils). Male flowers are found at the top of the plant body while female flowers develop at leaf-axils in the form of cobs. The beard-like silky threads of a maize cob are a part of female organs designed to receive pollen grains which are dispersed by wind. In another category of flowers such as that of magnolia, the male organs and the female organs, though seated together in the flower, mature at different times to avoid self-fertilization. Various insects like bees, butterflies, and beetles visit the flower in order to transfer pollen grains from one flower to another. Visiting insects receive nectar as their reward for their special services. They are like our priests who receive "Dakshina" for accomplishing a wedding ceremony.



The game of pollination between flowers and their pollinators is a most fascinating romance. Flowers develop myriads of colours and odours to attract their pollinators. Orchids are the most sophisticated in this regard. Strangely enough, some orchid flowers (*Ophrys* sp.) are mistaken as female partners by certain wasps. Male wasps perform a copulating act with these flowers. As a result, pollen sticks on the body of the wasp. Pollen grains are transferred to another flower when the wasp repeats the same act. The wasp like most insects is sexually mature, and stimulated, as soon as it comes out of the chrysalis. The childhood of such insects is spent while they pass through the larval and pupal stage. A lost childhood perhaps leads to a confused adulthood among these insects.

Watching bumble bees (Bhanwara) and humming birds when they visit their pollinating flowers is most exciting for us. The world of animal pollinators is very vast ranging from ants to bees, butterflies, beetles, birds, bats, monkeys or bears. What happens after pollination is obvious. Fertilization takes place. Fertilized eggs develop as seeds within fruits. The tomato we eat is a ripened ovary with a large number of seeds within, for instance. The tomato or any other fruit we eat is the gift of a flower given to animals including humans to ensure that its seeds are carried far and wide for dispersal. Coconut seeds are dispersed by sea waves while Simal seeds are dispersed by the wind. The xanthium seeds (Kurro) have hooks that attach to the wool of sheep and goats when they go for grazing. The Velcro mechanism which we use to fasten our boots and jackets was actually copied from Kurro seeds.



Thus, the structure of a flower and its subsequent fruiting is cleverly designed to ensure successful reproduction and re-distribution of species in Nature.

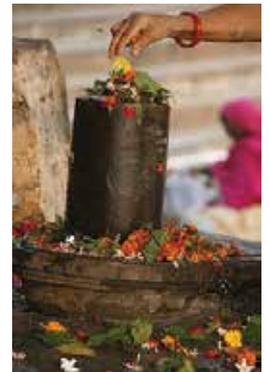
The structure and function of a flower has to be fully understood to ensure food supply. Plant scientists have estimated that one out of every three bites of food we eat comes from bee-pollinated flowers. A shortage of bees and other pollinators would lead to drastic crop failures. It was astonishing to learn that many farmers of Rupandehi district did not have this fundamental knowledge. A recent news item (Himal Khabar Patrica Weekly 11-17 Jan 2015) reported that mustard farmers prohibited bee keepers to forage in their fields. Farmers are said to be firm about the notion that bees suck flowers to the extent that they turn sterile and thereby fail to produce seeds. Farmers in other countries such as the US are known to import bees from other areas to meet the shortage of pollinating insects while the lack of awareness among our commercial farmers is rather shocking indeed.



Garden Flowers

The world of garden flowers ranging from azaleas, begonias, crocuses, and daffodils to valentine roses has been bred through artificial means and methods in order to add ornamental or aesthetic value to flowers. In the process, breeders and cultivators have made these flowers infertile. Today, thousands of hybrids decorate our gardens, parks, and indoor plantations. A valentine rose bouquet is, in fact, a bunch of sterile flowers. Such flowers do not have the capacity to reproduce like wild roses. Nonetheless, they carry human emotions and sentiments to express love or affection, pain or pleasure, joy or sorrow.

The 14th of February is approaching and floral markets are getting ready in the streets of Kathmandu. Roses are prized as valentine gifts all over the world. The "valentine culture" has been spreading like wild fire among modern youngsters since the last two decades. This is a fashion adopted from western culture. Hence our young people should also be aware of the floral codes in western culture. Internet searches will reveal that a long-stemmed red rose is in high demand because a red rose depicts romantic love. A bouquet of lavender (Pyaji) or lilac-coloured roses is said to be an expression of love at first sight. Pure white roses bestowed with truth and innocence convey a message that "I miss you and you are heavenly". Pink roses speak of high esteem or appreciation for someone you have admired for a long time. Yellow roses just speak of friendship and freedom. It can thus be insulting to someone you like to proclaim "I love you"! However, when it comes to yellow tulips, the meaning is entirely different. Yellow tulips convey that one is hopelessly in love with his or her valentine.



Floral codes in Nepalese culture and religions are equally important and fascinating. Presenting Makhmali (Gomphrena) during Bhai pooja, Gunkeshari (Narcissus) during Newar weddings, Dhatura to Shiva, and Doovo to Ganesh, Jayanti (Sesbania) to Laxmi, Asoka to Kali, and Kamal (Lotus) to Buddha or Brahma are popular in Nepalese culture.

The world of flowers and the flowers of the world tell us to love and respect the nature of a flower which is endowed with the power of creation and recreation. ■

Functions and Attributes of a Manager

Prof Dr Bhim Dev Bhatta

Management Concept

There are different types of organizations. Some are quite big while others are medium or small. All these organizations carry out different activities based on specific goals. Management plays a vital role in achieving the goals of the organization.

The term management has been defined differently by classic authors like Frederick Taylor, Frank Gilbreth, Henry Gantt, and Harrington Emerson although their theme is common. Of them, Taylor played a dominant role in his era.

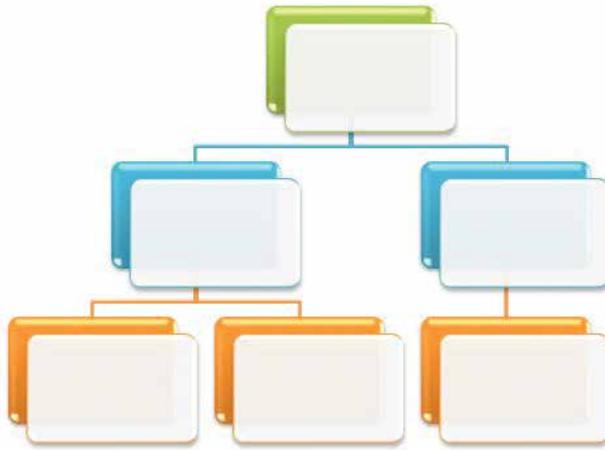
Following these authors, Henri Fayol, Mary Parker Follet, Harold Koontz, Kast & Ronenzwing, Stephen P Robbins and others have also defined and interpreted the concept of management in a lucid way. Lately, in 1990, Ricky W Griffin examined this subject in the backdrop of the system theory. His work has been widely quoted by writers.

In the words of Griffin, "Management is the process of planning, organizing, leading and controlling an organization's human, financial, physical and information resources to achieve organizational goals in an efficient and effective manner". In this definition, Griffin underlines the functions of a manager in the backdrop of resources.

Functions of a Manager

Indeed, the functions of a manager are planning, organizing, leading and controlling. Griffin co-relates these functions with resources: human resources, financial resources, physical resources and information resources. His definition has further clarified the concept of management. Now let us examine how these objectives are co-related with resources.

The manager's foremost function is planning. He/she should be able to plan about human resources, financial resources, physical resources and information resources. How many resources are needed to run a particular business, from where and at what cost those resources should be obtained, and how these available resources be utilized, should be the prime concern of the manager. Similarly, while organizing a business, the manager should pay attention to managing all



3M+I resources -- Man, Money and Material plus Information.

In the same vein, the manager should be in a leading position to control and to utilize all the available resources meaningfully. Thus, by co-relating the functions and resources as a part of the management process, the manager is identified as a planner, organizer, leader and controller of human, financial, physical and information resources.

Principles of Management

Henri Fayol propounded fourteen principles of management. In 1930, Henri Fayol's famous book General and Industrial Management, was translated from French to English. This multiplied his popularity. Like his contemporary, Frederick Taylor, he is widely acknowledged as a founder of modern management methods.

Fayol's 14 principles for effective management include (1) Division of Labour (2) Authority (3) Discipline (4) Unity of command (5) Unity of Direction (6) Subordination of individual to the common good (7) Remuneration (8) Centralization (9) Scalar of Chain (10) Order (11) Equity (12) Stability (13) Initiative and (14) Esprit de corps.

Significantly, Fayol's principles help managers learn how to organize and interact with their employees in a productive way. Thus, a successful manager must follow all these principles to attain his/her goals in an organization.

Attributes of a Manager

Enterprises and undertakings are segmented into different sectors such as industrial, business, service, social, public welfare, and financial sectors. To manage these sectors, employees having different academic backgrounds, work skills and experience are needed. The motto is to hire the right person for the right place. Of all the employees, the CEO or Manager plays a pivotal role.

In particular, Hahn Been Lee underscored four different attributes of a good Administrator or Manager. They include knowledge attribute, operational attribute (skill),

orientational attribute (values) and moral attribute (philosophy and standards). Besides, a manager should be amicable, co-operative, willing to take risks, charming, clever, hard-working, motivated, time-bound, dynamic and client-oriented. Hence, while appointing a CEO or Manager in any organization, it is necessary to explore the candidate's educational background, work experience and required attributes. This pays at the end.

The Nepalese Scenario

Nepal Bank Ltd. established in 1993 BS is a pioneering corporation. By the year 2049 BS, 66 public corporations had been established in different sectors. Most of these corporations were established by the support of friendly countries. After the political changes in 2046 BS, the Nepalese government privatized about 30 of these corporations. At

present, there are only 37 public corporations in the country. Poor management is one of the major problems in public sector enterprises in Nepal. Out of 37 corporations presently only 19 are in profit while 18 are in loss. In fact, most of the sick corporations are on the verge of liquidation.

Private sector management, particularly in the finance sector, is gradually emerging. It seems that this trend would soon gain ground in the public sector as well. However for this to happen, Nepal needs a firm and stable government.

Conclusion

The renowned Management expert Peter Drucker argues that, "There are no underdeveloped countries. They are only under-managed". Learning a lesson from him, we should try our best to enhance our managerial ability in the future. ■

Featured Research

Courtesy: Science Daily

Climate affects development of human speech:

A correlation between climate and the evolution of language has been uncovered by researchers. To find a relationship between the climate and the evolution of language, one needs to discover an association between the environment and vocal sounds that is consistent throughout the world and present in different languages. *Source: University of Miami*



Early human ancestors used their hands like modern humans:

New research suggests pre-Homo human ancestral species, such as Australopithecus africanus, used human-like hand postures much earlier than was previously thought. The distinctly human ability for forceful precision and power "squeeze" gripping is linked to two key evolutionary transitions in hand use: a reduction in arboreal climbing and the manufacture and use of stone tools. *Source: University of Kent*



Credit: © Eric Isselée / Fotolia

Arctic ice cap slides into the ocean:

Satellite images have revealed that a remote Arctic ice cap has thinned by more than 50 metres since 2012 -- about one sixth of its original thickness -- and that it is now flowing 25 times faster. The findings show that over the last two decades, ice loss from the south-east region of Austfonna, located in the Svalbard archipelago, has increased significantly. In this time, ice flow has accelerated to speeds of several kilometres per year, and ice thinning has spread more than 50 km inland -- to within 10 km of the summit. *Source: University of Leeds*



Revolutionary device found to lower blood pressure:

A revolutionary device has been shown to significantly lower blood pressure among patients with uncontrolled high blood pressure, compared to those treated with usual drug measures. "High blood pressure is very dangerous and leads to hospital treatment, stroke, heart attack and chronic kidney disease. We must find better means of treating high blood pressure as drugs do not work for everyone and the Coupler is a big step forward in our search for alternative treatment," said the lead investigator. *Source: Queen Mary, University of London*



Found: 'Fight or flight' response control center for the heart:

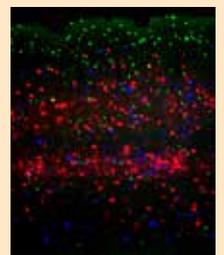
An animal study has uncovered what controls the ability of healthy hearts to speed up in response to circumstances ranging from fear to a jog around



the block. The key to the heart's "fight or flight" response, they report, is a channel in cells' energy factories, known as mitochondria, which appear to drive the heart to beat beyond its resting rate. Better understanding of this channel, called the mitochondrial calcium uniporter (MCU), could lead to new treatments for people whose heart rates needlessly accelerate, they say. *Source: Johns Hopkins Medicine*

On the ups and downs of the seemingly idle brain:

Even when it seems not to be doing much, the brain maintains a baseline of activity in the form of up and down states of bustle and quiet. To accomplish this seemingly simple cycle, it maintains a complex balance between the activity of many excitatory and inhibitory cells, scientists report. *Source: Brown University*



Climate Change Affects Biodiversity

Indra P Subedi



A Backdrop

Conservationist, Rachel Carson wisely states, “*But man is a part of nature, and his war against nature is inevitably a war against himself.*” Human activities are adversely impinging upon nature as is becoming increasingly evident in climatic phenomena. One of the important tenets of Earth science is that climate plays a major part in our planet’s environmental system. Even minor changes have impacts that are large and complex. Climate change affects people and nature, especially biodiversity, in numerous ways, and it often increases existing threats that have already put pressure on the environment. It is not a problem which has appeared overnight; it has been long since scientists first alerted the world to the dangers of climate change. James Hansen, a leading expert on climate change, had warned about the dangers of global warming due to greenhouse gases (GHGs). Humans, by burning of fossil fuels and other activities, have altered the global climate in a manner that will affect life on earth for centuries to come. How much longer are we going to allow it to continue? *When we change the climate, we change everything.*

Global Climate Change

Global climate change is occurring at an unprecedented rate today mainly due to an increased emission of GHGs such as atmospheric CO₂. Vital facts give solid evidence that has brought about a consensus among scientists:

- Global temperatures have increased by about 0.6-0.76°C since the mid-1800s and, according to the Intergovernmental Panel on Climate Change (IPCC) Working Group I (WGI) Fourth Assessment Report, a further increase in temperatures of 1.4°C to 5.8°C by 2100 has been projected.

- Rising levels of GHGs are already changing the climate according to the Report.
- Global mean sea level has risen by 12 to 22 cm during the last century. This change is affecting the entire world from low-lying islands in the tropics to the vast polar regions.
- During the next century, precipitation is also expected to increase by about 0.5-1% per decade for most middle and high latitude land areas in the northern hemisphere, causing more frequent flooding and droughts.
- Since climate is the fundamental factor that determines organism life-stages such as plant germination and flowering, it can severely alter habitats and food sources for animals, and ultimately, could have significant impacts on the biodiversity of species and ecosystems around the globe.
- Another predicted impact includes the risk of getting dangerous “vector-borne diseases” such as malaria.

Effects on Biodiversity

Global Climate Change affects physical and biological environments, thus, it influences biodiversity both directly and indirectly through its interaction with other environmental factors. There is ample indication that climate change affects biodiversity. According to the Millennium Ecosystem Assessment (MEA) 2005, climate change is likely to become one of the most significant drivers of biodiversity loss by the end of the century. Climate change is already forcing biodiversity to adjust either through shifting of habitats, altering the life cycles, or the development of new physical characters.

Some of the recognized effects of climate change on biodiversity and ecosystems that are important include:

- *Extinction of species and biodiversity loss:* Climate change has led to an increase in the rate of species extinction. The MEA highlighted a substantial loss of biodiversity on Earth, with some 10- 30% of mammal, bird and amphibian species threatened with extinction.
- *Phenology changes:* Changes have been recorded in the phenology of many species of plants and animals. For example, higher temperatures have led to earlier flowering in certain plant species and changes in the dates of egg-laying of birds and amphibia, or the timing of the developmental cycles of temperate-zone honey bee colonies.

- *Shifts in geographic range:* Climate change forces organisms to respond by adapting or migrating, and results in geographic range changes for species. For example, some migratory species can respond rapidly to yearly climate variation by altering the timing or destination of migration, but most wildlife is sedentary and so is incapable of such a rapid response. For these species, responses to the warming trend should be slower, reflected in poleward shifts of the range.
- *Ecosystem functioning and service changes:* Ecosystem production and stability are closely linked to biodiversity. Loss of biodiversity due to climate and land use change may lead to increased GHG emissions, further worsening climate change. In contrast, increases in biodiversity could enhance ecosystem productivity and carbon sequestration, and may reduce the negative effects of climate change.

Modern Conservation

Importantly, biodiversity can support efforts to reduce the negative effects of climate change. Conserved or restored habitats can eliminate carbon dioxide from the atmosphere, thus helping to address climate change by storing carbon. Further, conserving intact ecosystems such as mangroves can help reduce the devastating impacts of climate change such as flooding and storm surges. It is an established fact of conservation biology that biodiversity can reduce the negative effects of climate change. Conserving natural terrestrial, freshwater and marine ecosystems and restoring degraded ecosystems (including their genetic and species diversity) is essential for the overall goals of both the Convention on Biological Diversity (CBD) and the United Nations Framework Convention on Climate Change (UNFCCC). This is necessary as ecosystems play a key role in the carbon cycle and in adapting to climate change. They are essential for human well-being.

The Nepalese Scenario

Climate change is quickly becoming one of the major environmental issues in Nepal itself. Global warming has brought about high intensity rainfall during rainy season. It has also resulted in heavy floods, landslides, and soil erosion. It is also common now for many parts of Nepal to have droughts. Likewise, altogether 14 glacial lake outburst floods (GLOFs) have happened between 1935 and 1991, and 21 GLOFs have been identified as being potentially dangerous.

Unfortunately, there is clear evidence that climate change is already affecting biodiversity in the Central Himalayas. Nepal hosts some of the most spectacular natural areas and biodiversity in the world. It is home to the planet's highest peak, 118 ecosystems, 75 categories of vegetation, and 35 types of forests. The survival of Nepalese forests is in question. A land of forests, the country must conserve its pristine forest wealth. Scientific thought and public policy should inhibit human greed and irresponsibility to maintain the balance of Nature for our well-being.

Nepal is ranked 13th in the world in terms of climate change vulnerability as per the 2012 Climate Change Risk Atlas. It is no wonder that Nepal is now a priority country for the US Global Climate Change (GCC) Initiative. Moreover, in order to address the adverse impacts of climate change and to reduce the country's vulnerability to changing climate and extreme events, the National Adaptation Programme of Action (NAPA), the first official initiative to mainstream adaptation into national policies and actions, has been launched.

To Conclude

It is indispensable to control fossil fuel pollution and to stop developing nuclear weapons that are endangering the planet. As the window for action is closing rapidly, the world needs to be waked up immediately from its lethargy and start making changes.



GHG emissions should be limited at levels sufficient to keep average global temperature from rising more than 2°C above preindustrial levels. Efforts at reducing global emissions of heat-trapping gases have so far been totally insufficient. Unless much greater emissions reduction occurs instantly, the countries of the world will have emitted enough CO₂ and other GHGs by the end of this century to profoundly transform the Earth's climate. Year 2014 was the hottest on record and that the tipping point of ice loss in west Antarctica has been reached, meaning the melt is now unstoppable. The climate changes that human are driving will harm millions of people and will threaten many key ecological systems on which civilization relies.

Above all, the country, like the rest of the World, has to prepare itself much more so to try and mitigate the multifarious effects of climate change as far as possible guided by the belief of deep ecology that the living environment – Nature – as a whole should be respected and regarded as having certain inalienable rights to live and flourish. Perhaps, we need to be forewarned by the 1952 Nobel Peace Prize winner Albert Schweitzer's minatory words: "Man has lost the capacity to foresee and to forestall. He will end by destroying the earth." If we act now, with a reverence for life, contemporary human existence would not become a fable for tomorrow.

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How could Time be defined?

Aashwin Basnet

The Wikipedia defines Time as “a dimension in which events can be ordered from the past through the present into the future, and also the measure of durations of events and the intervals between them.” Time has always been a matter of mystery for human beings because even till now we have not been able to unveil the hidden secrets of Time. What exactly is it?

Is Time something real or just an illusion according to Einstein? Well, honestly, we don't really know! Physicists and philosophers round the globe have their own stances on time and very often their opinions meet on a collision course. Not only followers of Science but also those of Religion or Philosophy have entered the race to unravel the mystery of time. Some extraordinarily argumentative definitions of Time include “time is what a clock measures” and “time is what keeps everything from happening at once”. While Newton sided with the realistic view of Time as a fundamental entity of the universe, others like Gottfried Leibniz and Immanuel Kant disregarded the realistic view and opined that it is not measurable. In Physics, Time is often intertwined with another entity of the universe, i.e. Space, making them Space-Time, two different yet closely related entities of the universe.

“For an idea as primitive yet indispensable as Time, the fact that we invent the concept rather than having it handed to us by the universe is less obvious. Time is something we literally don't know how to live without.” Time can be analyzed under three different aspects all of which seem remarkable to us:

- Time labels the moments in the universe: Time is a coordinate and helps us locate things in space.
- Time measures the duration between any two sets of events: Time is what clocks measure.
- Time is a medium through which we move: Time is the agent of change. We move through it, or equivalently, time flows past us, from the past, through the present, towards the future.

Even though all of these aspects remain closely related or seem to be, as we dig more deeply, we come to know that



these ideas needn't be related to one another. They present logically independent concepts that happen to be tightly intertwined in our world.

Time is a very elegant concept, a well-devised concept to keep the universe going . . . In our daily lives, we hardly have any time to wonder about its elegance and mystery. The moment that it freezes will mark the end of the universe, and, therefore, it can't freeze! Time is not just the duration between events as we see them. It is a dimension of the coordinate system through which we move or exist.

The next time someone asks you to define this elusive concept, don't forget to tell him or her about some of the huge secrets of Time lying underneath all the simplicity. This concept has been the matter of great reflection, even worry, for physicists and philosophers for a long time and even now its subtle nature hasn't been demystified. In such circumstances, indeed, we cannot treat Time as a simple concept or a simple thing! ■

"What we know is a drop, what we don't know is an ocean."

Isaac Newton

Trinity SciTech-&Mgmt EXPO

Exhibitions-cum-Competitions *Getting Things Done*
January 30, 2014, (Magh 16, 2070) Kathmandu



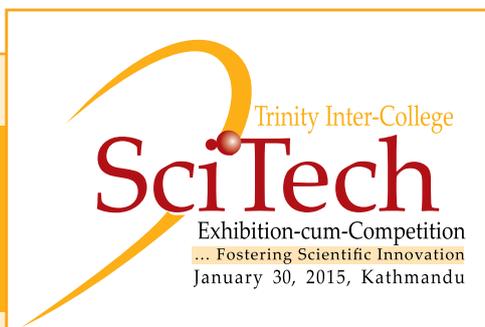
Review

Imparting Practical Education Blended Learning for Innovation

The SciTech-&-Mgmt Expo is a distinctive blend of science, technology, and management. It furthers Trinity's legacy of excellence in education by correlating curricular, co-curricular, and extracurricular activities. It is a forum for the meeting of young minds for sharing ideas to help in discovery and innovation. The Expo focuses on the need for coupling scientific knowledge to managerial practice. Science is a realm of wonder that inspires scholars to explore possibilities. Deeper knowledge about science disseminated through such events helps students to understand scientific thought and find ways to tackle contemporary issues relating to green technology, infrastructural development, or natural resource management with a view to develop the nation.

Open to all +2 and A level colleges in the valley, the Third Trinity SciTech-&-Mgmt Expo was held on 30 January 2014 (Magh 16, 2070). The event, incorporating participation of twelve Colleges for Inter-College SciTech Exhibition-cum-Competition, nine Projects for Intra-College SciTech Exhibition-cum-Competition and thirty projects for Intra-College Management Exhibition-cum-Competition, was inaugurated by Prof Dr Surendra Raj Kafle, Vice Chancellor, NAST, who keenly inspected all the projects. Thousands of visitors graced this splendid occasion. We expect greater participation this year and hope to draw out the best from all the participating youngsters.

We heartily welcome all Expo 2015 participants and visitors!



Participating Colleges in the Trinity Inter-College SciTech Exhibition-cum-Competition 2012, 2013, 2014 & 2015

- Budhanilkantha School 2012, 15
- Campion Academy 2013, 14
- Canvas International College 2012, 15
- GEMS Institute of Higher Education 2014
- GoldenGate International College 2013, 14, 15
- Grammer Public H S School 2013
- Guinness International College 2012
- Himalayan WhiteHouse International College 2012, 14
- Kanjirowa National School 2012, 15
- Kathmandu BernHardt College 2014
- Kathmandu Model H S School 2012, 13, 14, 15
- Liverpool International College 2014, 15
- NASA International College 2013, 14, 15
- Nepal Mega College 2013, 15
- Nobel Academy 2012, 13
- Pentagon International College 2013
- Sainik Awasiya Mahavidhayala 2015
- Saipal Academy 2012
- SOS Hermann Gmeiner H S School 2013, 15
- Southwestern State College 2012, 13, 14, 15
- St. Lawrence College 2015
- St. Xavier's College 2012, 13, 14, 15
- St. Xavier's School 2015
- Trinity International College 2012, 13, 14, 15
- Universal College 2012, 13
- VS Niketan College 2014, 15
- Xavier International College 2013, 15
- WhiteGold International College 2013