November 10th have been named as the National Science Day by the Ministry of Science Technology and Research concurrently with the World Science Day. Accordingly, the national celebration is held today (the 10th), at the DS Senanayake College, with the Minister of Science Technology and Research Susil Premajayantha presiding over. The National Science Day celebratory walk is scheduled to be held on the 11th of November, starting from the ITI premises to the Viharamahadevi Park. The Kandy district ceremony of the World Science Day celebration program, is scheduled to be held at the NIFS on the 13th of November from 9 a.m onwards. The event is organized by the National Institute of Fundamental Studies (NIFS).
"Nano" insinuating into public consciousness

Over the past few decades the word ‘nano’ has become rapidly insinuating into the world consciousness. It has already conjured up speculation about a seismic shift in almost every aspect of science and engineering. This new technological singularity is reshaping across the globe today.

A nanometer (nm) is one-billionth of a meter, smaller than the wavelength of visible light and a hundred-thousandth the width of a human hair. In other words a nanometer is defined as the size of 10 hydrogen or 5 silicon atoms in a line within the power of the human mind to grasp. “One nanometer is in fact a magical point on the dimensional scale. Nano-structures are at the confluence of the smallest of human made devices and the largest of the living things”. This field is defined primarily by a unit of length, a nanometer, which has the ultimate control over the form and function of matter, particularly the particles with 1-100 nm dimensions. It promises more for less: smaller, cheaper, lighter and faster devices with greater functionality, using less material and consuming less energy.

"Nano" is a Big Business

Current Nanotechnology expenditure via the US federal budget is over $1B per annum; with a further $3-4B pumped by ‘other’ sources. Therefore, ‘nano’ is already a priority for technology companies like HP, NEC and IBM who have developed massive research capabilities for studying and developing nanotechnology-based services and devices. Despite surprising levels of nanotechnology research and development (R&D) in the developing part of the world, arguments concerning nanotechnologies’ role, relevance and appropriateness with respect to developing countries remain disengaged.

**Sri Lanka’s Opportunity – Nanoagriculture**

Nanotechnology can be harnessed to address some of our country’s most critical development problems. As speculated by other nations, the Sri Lankan science community too believes that whilst nanotechnology research and development is ‘high-tech’, the products it enables can be appropriate for use throughout the world. Nanotechnology research in Sri Lanka should enable the local industries to face the risk and compete globally. Therefore, we have to experience differing forms of engagement with nanotechnology but can we comment on any overall impacts. However, we have to identify systematic prioritization of applications of nanotechnology targeted towards these challenges faced by the people living in Sri Lanka. Nanotechnology applications for Sri Lanka can be ranked according to their potential future applications in our part of the world. In this context, agriculture based value addition would be unarguably the first leap we can make in the field.

Since, nanotechnology will leave no field untouched by its ground breaking scientific innovation, agricultural industry is no exception. Innovations in agriculture have received the highest scientific attention ever in the history mankind. Currently, the world population is reaching 8.0 billion and predicted to hit 10.0 billion in 2050. With these astounding numbers, feeding the population with substantial amounts of food is getting critical. Even though, the green revolution safeguarded the almost doubled population of the world throughout the last five decades, the price paid is enormous as many unpleasant activities such as contamination of water resources by agrochemicals, emission of greenhouse gasses, loss of crop genetic diversity, eutrophication and destruction of marine and other ecosystems that fouled Mother Nature, emerged as a result. Mitigation of such effects has been discussed in policy levels though regulating it is not easy when it comes to the requisite mentioned earlier. Thus, using the technologies in a sustainable manner is quite important considering the survival of humankind. Sustainable agriculture comes into the arena in this status quo and nanotechnology has a tremendous potential to revolutionize agriculture and allied fields, including aquaculture and fisheries. Nanotechnology offers the agricultural and food industry with new tools for the molecular treatment of diseases, rapid disease detection, enhancing the ability of plants to absorb nutrients etc. Smart sensors and smart delivery systems will help the agricultural industry combat viruses and other crop pathogens. In the near future nanostructured catalysts will be available which will increase the efficiency of pesticides and herbicides, allowing lower doses to be used. Nanotechnology will also protect the environment indirectly through the use of alternative (renewable) energy supplies, and filters or catalysts to reduce pollution and clean-up existing pollutants. In addition, nanotechnological devices provide “scouting” capabilities which could tremendously improve the grower’s ability to determine the best time of harvest for the crop, the vitality of the crop, and food security issues, such as microbial or chemical contamination.

**Nanofertilizer Innovation**

Farmers often use urea, as a rich source of nitrogen, as fertilizer. Its drawback, however, is that it dissolves quickly in wet soil forming ammonia. The ammonia is washed away, creating a major environmental issue leading to eutrophication of water ways and ultimately entering the atmosphere as nitrogen dioxide, the main greenhouse gas associated with agriculture. This fast decomposition also limits the amount of nitrogen that can be absorbed by crop roots and requires farmers to apply more fertilizer to boost production.

Annually, Sri Lanka imports an average 400,000 metric tons of urea (FAO, 2017). Unfortunately, 70% of the urea is destroyed due to leaching, evaporation and enzymatic degradation. In order to address this issue, Sri Lanka Institute of Nanotechnology initiated a project with the collaboration between Hayleys Agro PLC to develop a slow release nitrogen fertilizer using nanotechnology. Here, a novel approach was introduced to reduce the solubility of urea by making a nanohybrid with hydroxyapatite nanoparticles overlaid with urea. This nanohybrid with a nitrogen weight of 40% provides a platform for its slow release leading to efficient absorb by plants thus minimizing the premature loss of nitrogen.

Prof. Nilwala Kottegoda
“The nation which doesn’t create new things, will not rise” stated the great author Kumarathunga Munidasa. Accordingly, to lead Sri Lanka forward in the field of Science, Technology and Innovation, we should perfectly arm the children as well as the young generation with the knowledge of science. The Ministry of Science Technology and Research, is all set to make the Science Day, 10th November (today) productive for the whole nation including the small children. It is time to uplift the country, making way for new pathways of development, along with the benefits of the field of Science and Technology. We can make use of this opportunity to utilize the great inventions and research by our scientists productively. Many programs are carried out by the institutes under the Ministry of Science Technology and Research, such as National Science Foundation, National Science and Technology Commission, Institute of Nanotechnology, National Institute of Fundamental Studies and the Arthur C Clarke Institute of Modern Technology, for the university community and for the young crowd who follow higher studies. Science Day will be productively utilized to make way for new pathways of science by the Sri Lanka Standards Institution, the Planetarium, the National Inventors Commission, Industrial Technology Institute, the National Research Council, and the Vidatha Resource Center (VRC) island wide etc.

I add my heartiest greetings for the success of national science week, which is for the betterment of Sri Lanka’s scientific development, social progression and for the future of the field of Science in the country.

Lakshman Senevirathne
State Minister,
Ministry of Science, Technology and Research

Vidatha program has been initiated in 2000 as a concept and became official in 2005 with the primary purpose of uplifting rural economy through the scientific development and cultural progress. It is expected to be carried out by bringing the benefits of the current progress of Science, Technology and Innovation to rural areas. 265 Vidatha Resources Institutes have been established island wide. The Vidatha program entrepreneurship is operated through its staff and the resources by the Ministry of Science, Technology & Research. It is targeted scientifically empowerment on three areas: the daily and common affairs of the public, and the future generation. Vidatha Resources Centre utilizes internet and IT facilities when carrying out the affairs of annual plans, progress, decrees and instructions, as government regional sub offices. The Vidatha Centre is working efficiently towards reaching the above mentioned goal with various programs such as popularizing technology through technology assignments, maintaining the data storage on entrepreneurship, providing constant post inquiry and consultation services, providing facilities for scientific experiments, supporting the products of the entrepreneurs to acquire certifications such as Sri Lanka Standards Institutions’ Vidatha System Certificate (VSC), Good Manufacturing Practices certificate (GMP), Sri Lanka Standards certificate (SLS) and ISO standards certificate, and Quality Assurance reports of Industrial Technology Institute, to bring them national recognition. In addition, various programs such as conducting “Vidatha Clinics” in district level, to bring solutions for the problems of entrepreneurs, providing financial contributions for regional products of entrepreneurs, conducting free IT courses, maintaining small library services, and maintaining a bilingual (Sinhala/Tamil) web blog site called ‘Prabhaswara’ (Vidathanet.blogspot.com) to bridge the gap between knowledge and to encourage innovations. Further Vidatha contributes directly to the current government’s primary project, ‘Toxic Free Nation’.

It is a great pleasure for me to mention that the Vidatha program is ready to provide its maximum support for the Science Day and the Science Week which are held by the Ministry of Science Technology and Research, concurrently with the World Science Day and I add my heartfelt greetings for the whole process.

J.M Mangalatissa
State Secretary,
Ministry of Science, Technology and Research

The theme of this year’s World Science Day for Peace and Development is “Science for Global Understanding” which is internationally celebrated day to highlight the importance of science in and for society and that science, peace, and development are interlinked. Science, Technology & Research provide key answers to build peace and boost the sustainable development of the country. The goal of sustainable development is to increase the quality of life for all people without increasing environmental degradation and without compromising the resource needs of future generations. We, Ministry of Science, Technology & Research stand at the heart of the agenda of the sustainable development of our country.

Science education and research capacity need to be built to allow to develop our own solutions to our problems. Ministry of Science, Technology & Research provides guidance in developing or revising policies and in strengthening national capacities in science education and research. We seek to transfer science knowledge and innovations of scientists of small and medium entrepreneurs through 266 an island-wide network of Vidatha Resources centers.

Ministry of Science, Technology & Research plays a significant role in contributing to national development by promoting science and technology with a vision to become a scientifically and technologically advance country by the year 2020.

Udaya R. Seneviratne
Secretary,
Ministry of Science Technology and Research

Friday, November 10, 2017

State Minister,
Ministry of Science, Technology and Research
There are some prime benefits of nano scale nanostructures are being utilized. Nanotechnology is used to distinguish any discrepancy in the identification of illnesses through bio molecules. Imaging and identification

1. The rapid analysis in determining illness
2. The rapid identification of the bio molecules (identification of the bio molecules)

A medication is divided into two sections. The medicine, using different nano structures. The medicine, using different nano structures.


Nano scale medications are being created in the modern world with the progress of targeted medicines. The identification of internal and external medicine, bone substitution and the production of antibiotics.

A considerable progress has been achieved in nanotechnology and its medications, during last two decades. Many nanomedicine products have been launched so far. By 2020, 1/3 of the nanomedicine related research reports and patent licenses will be related to the market in large scale product. Currently, around 1300 nano medications have been registered for clinical research, and the rapid development of nano scale medicines is obvious, considering further in the future.

The unique bio molecules of different cancer diseases, has been made and used as the cancer cells are detected, identified and targeted.

Prof. Dileesa Dias

What is Nanotechnology?

Public awareness of nanotechnology has greatly increased in the early part of this new century, with numerous referencess in popular culture, most notably the "Grey Goo" by Michael Chrichton's bestseller. Presently, there is great interest in the field. With all the innovations in nanotechnology, it is hard to define nanotechnology, but for the purposes of this article, we shall adopt the term as a bottomup design approach to producing the 4th Century. Lycus Cup the Romans used 700 silver coins to produce color and paste. It is also possible that the 5th Century masterpiece at Signum did not only use a basic paint, it was composed of metal nanomaterials. Although the concept of the atom can be traced back to Greek antiquity, with Democritus of Abdera (440BCCE) asserting that all material objects are composed of extremely small irreducible particles called atoms.

What is the Internet of Things?

The Internet of Things (IoT) generally refers to scenarios where network connectivity and computing capability extends to objects, sensors and everyday items not normally considered computers, allowing these devices to generate, exchange and consume data with minimal human intervention.

Source: Vijudwara Magazine

Internet of Things

A Magnificent Future...

ROBOT C-SPACE Technology

In the debate about using space, Galileo Galilei said that the Earth was the centre of the Universe which was the proposed argument of Greek scientists Aristoteles and Ptolomy. The Polish astronomer Nicolaus Copernicus argued that the Sun was the centre of the solar system in his book 'On the Revolutions of the Heavenly Bodies' in 1543; Italian astronomer, Galileo Galilei supported this argument following his invention of the astronomical telescope which have been used to observe the universe, and led to the path of observational astronomy. It would be wise to say that Galileo Galilei's astronomical telescope was a hit for the astronomers. The use of astronomical telescopes has been a hit for the astronomers. The use of astronomical telescopes has been a hit for the astronomers.

Space Era began with the successful launch of Sputnik 1 in 1957, Vanvit 3RA spacecraft was the first manned flight to take a human being to space in 1961. Along with these and the continuously progressing milestones in space exploration, the race to an astonishing event took place in 1999, with Mars landing on Mars. Since then many manned missions were limited to the Low Earth Orbit (LEO), and most robotic missions that approached beyond that werecury on Mars. Currently the greatest ongoing debate in space exploration is manned or unmanned missions.

History of Space Exploration

The universe is a plane filled with mysteries and myths. When humans looked up at the night sky and tried to explain the universe and its contents, their inability to observe them close enough limited their understanding. The human race always tends to seek meaningful answers for any phenomena, and in fact this is a function of left hemisphere of the human brain. This behavior led human beings to discover and analyze the origins of the Universe, and its contents, which in turn led to the beginning of space exploration.

Nobel laureate Richard Feynman (1918-1988) further on the subject. It is the extraordinary Caltech physicist and Nobel laureate Richard Feynman (1918-1988) that many people cite as the inspiration for modern nanotechnology. In a lecture titled 'there's plenty of space at the bottom' presented at the American Physical Society in 1959, Feynman outlined the challenges and opportunities afforded by engineering at the atomic scale.
The Science Film Festival received 200 films from 35 countries this year. Over 40 international science educators and science communicators selected the films to be screened at the event. In total, 67 films were chosen as finalists in the festival program. The festival is a celebration of science communication and enjoys a unique position in Southeast Asia, South Asia, Africa and the Middle East. In cooperation with local partners it promotes science literacy and awareness of contemporary scientific, technological and environmental issues through international film and television content with accompanying educational activities. The event has grown steadily since its first edition in 2005, becoming the largest event of its kind worldwide with nearly one million visitors.

The Science Film Festival in Sri Lanka is scheduled to be held from 23rd October to 23rd November 2017 by the Ministry of Science Technology Research.

If you haven’t got the chance to participate yet, call 011 2867637
The world has stepped into an industrial dimension after the Industrial Revolution, abandoning the traditional agricultural life style they led for thousands of years. As a result of this, the inherited education provided by the religious institutes was casted aside and new scientific knowledge based educational style has been replaced. New subject fields included science, mathematics, technology and engineering science among the old fields such as theology, philosophy and arts.

A Worth of Knowledge
The ultimate result of this was, a great worth of knowledge has been vested into human civilization. The transistor has been invented as a result of Quantum Science and Einstein’s new theories, and the computer has been modified with a bigger capacity to store data. With the new developments of medicine, the population has also been increased. Further, as a result of technology, the transportation and the spread of knowledge has also been widened. The new inventions began to spread all around. Now we have reached the glory of the civilization.

Eradications of the Earth
With the abundance of usage of the materials, many of the materials will be eradicated from the world. Furthermore with the bulky usage of the fossil fuels, it is predicted that fossil fuels will no longer be a commercial commodity but an armament by 2040.

Many of the employment opportunities will be lost in the future due to the development of the artificial intelligence. As an example, the field of accountancy will be totally removed by 2030. According to the facts revealed from the research, a forecast has been presented about the possible job market in the future and it is predicted that the 60%-65% of the job opportunities will be created from the fields of science, mathematics, technology and engineering science. Recommendations have been presented on the educational methods suitable for the future job market, based on this research. Accordingly it is suggested that, around 65% of the school children should be facilitated to follow the above mentioned fields. This educational process has been introduced as the STEM education by the specialists. STEM represents the subject fields of Science, Technology, Engineering and Mathematics.

STEM Student Community
Based on these recommendations, the specialists of different countries have been rapidly modifying educational methods of their countries. Considering the current situation, the STEM student rates have been recognized as of US 22%, Australia 18%, and Japan 8%. Accordingly it is predicted that a worldwide demand will be created for the STEM specialists. Considering the Sri Lankan data, around 18000 students have been following STEM subject fields in 2000 and as a result of the efforts of the government, it has increased into 55000. It is a 33% of the total student rate. To reach this goal, the schools which follow science and mathematics streams for SLs, have been scheduled to be increased into 1017. In addition, technology stream has been newly introduced for the schools and proceeded in 250 schools. Although this condition can be recognized as positive, we still stay regressive compared with the other Asian countries. The STEM student rate in India is 60% already, and Vietnam, Korea and China is reaching the level. Accordingly it is predicted that these countries will reach a highly profitable economical development in the future.

STEM Education Benefits
Thus as a developing country we also should focus more on the STEM subjects. If we were able to create technological scientists, we could export specialist laborers such as engineers and scientists instead of untrained laborers, (housemaids, drivers, hand workers), eventually reaching a massive progress in the economy of the country. We can expect a huge scientific investment to flood into the country, which is rich with skilful young people. Today, India has reached this goal and they have become the country which earns the highest income by producing software.

Time to Think!
India is a country which possesses healthy principles. According to their educational system, it is compulsory for every student who follows science stream to follow an appreciative subject. They believe in a absolute mental health for a balanced personality. This concept has been named as STEM or STEAM. It is necessary to develop STEM educational methods better than the short description based Sri Lankan educational principle planning, modify the syllabi to be suitable for the future, and to bring a complete conversion to examination procedure. Universities should focus on introducing new subject streams and they should be practical. Further it is important to introduce the subject fields such as Oceanography into school system. Lastly the most important advice that has to be given for the school children is to refocus on the STEM subject fields.
We all are today sailing through the 21st century. The concepts and the terminology of knowledge society, high technology stocks, information superhighways, biotechnology and even nanotechnology are all being used quite liberally. More and more words are getting added every day – Big Data, Artificial Intelligence, Vertical Agriculture, and Personalized Medicine! Let us understand and agree on one fundamental fact. It is Science and Technology that is behind all these developments and man’s insatiable capacity to question and innovate.

Sri Lankan Background of the Field of Science
According to the GCE O/L results of the past few years only 45% have passed in the science subject meaning that more than 55% has failed at ordinary level in science. More than 50% of your future generation failing in science should be sending shock-waves though the establishment. In 2006 the failure percentage for science was 51.65%. Hence this is not just one incident but a continuing trend. Plot the curve and with extrapolation one could predict when Sri Lanka is going to be totally unscientific! Even though science is considered as a core subject at ordinary level the core function the subject is to play in nation’s development is poorly understood.

Science and Foreign Media
Tune into a different TV channel or switch to a different radio station. We are all being “broadcasted” by what we see, hear, and read. How often do we analyse what we see, hear, and read? This is the process we are going through every day. The climate is conducive for purposes of selling and advertising. Science and technology stocks, information superhighways, biotechnology and even nanotechnology are all being used quite liberally. More and more words are getting added every day – Big Data, Artificial Intelligence, Vertical Agriculture, and Personalized Medicine! Let us understand and agree on one fundamental fact. It is Science and Technology that is behind all these developments and man’s insatiable capacity to question and innovate.

See the role Scientific American is playing in US and the role it had played. Scientific American, is the oldest continuously published magazine in the U.S. (sorry it is not Playboy which occupies that distinguished position), has been bringing its readers unique insights about developments in science and technology since 1845 when an inventor R Porter started the magazine as a biweekly.

The Patents
It is interesting to note that this magazine clearly showed communication to masses matter and once the critical mass is made there is no way of holding back development. Sri Lankans can boast of scientific advances. However, these really come from our past. However, it is important that these advances are known to many and they in turn stimulate the current generations to go further. When Dr Gill Juleff from University of Exeter, UK wrote on her findings – ‘Monsoon Steel’ at Samanalawewa on the advanced steel production using a unique furnace type by Sri Lankans around 350 BC she placed Sri Lanka also on the nanotechnology timeline.

When Dr Gill Juleff from University of Exeter, UK wrote on her findings – ‘monsoon steel’ at Samanalawewa on the advanced steel production using a unique furnace type by Sri Lankans around 350 BC she placed Sri Lanka also on the nanotechnology timeline. This was a discovery that another magazine Discover hailed and placed among the top 100 scientific discoveries of 1996. When this superior steel reached blacksmiths who made the ‘Damascus Swords’ the steel plus the forging had led to nanostructures based on carbon nanotubes which imparted superior properties.

1900 Scientific American had supported more than 100,000 patents. Sri Lanka cries out for innovators and some innovators cries out for support to make their inventions to be commercialized. The need is there but there has been no meaningful response. US

Attractive Presentations of Science
There is a need to communicate science in a way that it is meaningful and elegant so as to capture the imaginations of the young mind. Scientific literacy is a must these days. What is to me a complex and a perplex problem is that Sri Lanka having probably one of the best literacy rates for any developing nations and perhaps can even rival some of the developed nations what it delivers. In the absence of what this literacy rate is contributing I am always interested in seeing what actually are these literate masses are reading!

Let us take a close look at ourselves and the developing generations. We must move on getting science back on to the main menu, get the children to digest it well and lead us from the wilderness and back to the scientific frontiers. We do have a magazine today – Sri Lankan Scientist – thanks to the committed effort of few youngsters - and if we get that in all three languages all the better.

This year Sri Lanka is going to celebrate the ‘World Science Day’ on Nov 10th in a bigger scale and across the provinces. The events will not be confined just to the day. Please just do not only look at the celebratory part but consider why the message is being sent. That is much more important for Sri Lanka’s sake!

Prof. Ajith de Alwis