Another mission of the Ministry of Science, Technology and Research

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Government Relations

The inaugural Exhibition of the “Shilpasena” Expositions with the objective of spreading science and technology to the grass root level, will be held from 18th to 21st July at the Bandaranaike Memorial International Conference Hall.

continued on page 03...

“Shilpasena”
July 18th to 21st
at BMICH

The 5th World Invention Innovation Contest (WiC-2019) winners
continued on page 03...
School Science Society Programme

Objectives
- To foster students to acquire knowledge on latest developments in various fields of science and technology
- To make them aware of the application of scientific knowledge in day to day activities
- To improve the standard of living by popularizing Science, Technology, Engineering and Mathematics (STEM) education among school children
- To create a research culture among school children

Benefits provided to the registered School Science Societies
- Resource persons for scientific programmes organized by the School Science Societies.
- Funding for Science Education and Science Popularization projects based on the project proposals submitted by schools (up to maximum of Rs1Mn per project).
- Opportunity to participate in competitions and other programmes organized by the NSF
  - Inter-school Science Society Competitions
  - NSF Teachers’ Award for Popularization of Science in School Community
  - Science Research Projects Competition (SRPC), Sri Lanka Science and Engineering Fair (SLEEF) and International Science and Engineering Fair (ISEF)
  - World Science Day Schools Programme
- Directing and funding students to participate in International Science Competitions
- Free distribution of Vidurava Science Magazine and science books/booklets
- Star Rating Awards for best School Science Societies

Your Responsibility…..
- Active participation in competitions and programmes organized by NSF
- Organizing School Science Days and other Science related activities within the schools and in their areas
- Continuous collaboration with NSF activities throughout the year
- Providing a detailed report to NSF for “Star Rating”

For further information please contact:
Head – Science Popularization Division (SPD)
National Science Foundation 47/5, Maitland Place.
Colombo 7 / 011 2209509 / 011 2696771 ext 180 / spd@nsf.gov.lk

ACCREDITATION

Adding Value to the Supply Chains
- Delivers a safer world
- Delivers confidence in construction and the built environment
- A global toolkit to support Public Policy
- Supports delivery of Health and Social Care
- Delivers confidence in the provision of energy
- Facilitates World Trade
- Ensures Safe food and clean drinking water
- Supports the needs of regulators
- Ensures Global Acceptance
- Ensures Competence
- Delivers Trust
World Accreditation Day 2019 highlights the role of accreditation in adding value to supply chains.

Supply chains provide a vital role in delivering products and services for consumers, business and the public sector in a timely, cost-efficient and quality manner. Supply chains are constantly evolving from complex systems crossing multiple borders to new and diverse supply chains aimed at ensuring all stakeholders’ requirements are met, including the need for ensuring sustainability and responsible supply.

Accreditation and, with it, other quality infrastructure tools such as standards, metrology and conformity assessment, provide widely accepted tools that help deliver value to the supply chain. These tools help with trust and assurance, enabling confidence in both final products and services and the manner in which they are placed on the market and used.

From the accreditation of laboratories which test safety of toys, the inspection of manufacturing processes, to the accredited certification of food manufacturers to food safety standards, accreditation adds value to supply chains by supporting the wide spectrum of needs of interested parties.

Global supply chains which cross international borders are significant beneficiaries of the global nature of accreditation. The International Accreditation Forum (IAF) and the International Laboratory Accreditation Cooperation (ILAC) both manage accreditation based on internationally developed and accepted standards. As such, laboratories, inspection bodies and certification bodies are accredited against international standards. Conformity assessment bodies in turn use global standards to evaluate samples, products, services, management systems and persons. By having this global accreditation system in place, confidence is provided for each leg of supply chains, helping businesses deliver products and services which, most importantly, consumers can trust.

The system of accreditation has been estimated to cover economies that represent 96% of global GDP (Source: World Economic Forum); IAF members accredit certification bodies and verification/validation bodies and ILAC members accredit laboratory and inspection bodies. This system helps to ensure the work of accreditation bodies across the globe is consistent, maintaining international standards from one accreditation body to another.

The mainstream acceptance of accreditation by both pan-regional and domestic regulators within individual governments also helps WTO member governments to meet their responsibilities under the Technical Barriers to Trade Agreement. This example demonstrates one of the key goals of accreditation to support trade.

World Accreditation Day 2019 aims to highlight and celebrate the way accreditation adds value to supply chains.

Extracted from the Joint Statement by Xiao Jianhua, Chair International Accreditation Forum (IAF) and Etty Feller, Chair International Laboratory Accreditation Cooperation (ILAC)

Sri Lankan inventors won three Gold awards, three Silver awards, five Special awards, One Grade award and Semi-Grand award representing Sri Lanka in the 5th world innovation contest. In addition to them, Prof. Rangika Umesh Halwatura, Commissioner of Sri Lanka Inventors Commission participated as Head of the Delegation representing Sri Lanka and he was also appointed as an International Jury Member of WiC-2019. The awards winning details of Sri Lankan inventors are as follows. Wijayapala Welgama - Elephant Distance Tracer & Chaser for Human Safety - (Gold Award, Semi-Grand Award, 1st Grade Award) Wijayapala Welgama - Human Safety Beam - (Silver Award, Special Award) Wijayapala Welgama - Survival Kit for Any Disaster -(Silver Award, Special Award) Warnakulasuriya Dinesh Sasika

This is a concept of the Hon. Minister for Science, Technology and Research and the exhibition will be presided by the president Mithripala Sirisena and the Prime Minister Ranil Wickramasinghe. This series of expositions will be held under four main clusters and 12 major technical themes. The first exhibition will be held in the Colombo and then will go through Anuradhapura, Jaffna, Kandy and Matara districts.
Greenhouse Effect of the Planet Earth
A part of the energy being received by the earth which is emanated from the sun is reflected by the atmosphere of the planet earth and another part is absorbed by the greenhouse gases. These greenhouse gases maintain the temperature at an appropriate level (33°C) enabling the existence of flora and fauna on the earth’s surface. These temperatures maintaining process is vital in ensuring life on the planet earth. This natural process is called the greenhouse effect. Humidity, carbon dioxide, Methane is some of the greenhouse gases which help to maintain the temperature on the earth’s surface. This greenhouse effect has been created as the planet earth is located at a moderate distance from the sun, with a suitable mass for creating the gravity and greenhouse gases in the atmosphere around the earth.

Artificial Greenhouse and protected Agricultural houses
Artificial greenhouses have been created for areas without suitable temperatures for agriculture. Artificial greenhouse effect will be created artificially inside these greenhouses so as to provide appropriate temperature for agriculture in the artificial greenhouses. Transparent glass through which sunlight travels well are used for artificial greenhouses. These greenhouses maintain a higher temperature than the environment temperature stimulating the plant growth. This artificial greenhouse agriculture is best suited for areas with less space. Artificial greenhouse effect is also created to a certain extent within protected agricultural houses. Plastic covers are used for protected agricultural houses. Farming in the protected agricultural houses can be carried out in all areas in Sri Lanka.

Importance of farming in greenhouses and protected agricultural houses.
The land area which can be allocated for agricultural purposes is decreasing day by day with the development activities which are taking place in country. Therefore, we are facing the challenge of harvesting a high quality and sufficient yield from minimum land areas. In order to overcome these challenges modern technologies should be made use of and under this initiative greenhouses and protected agricultural houses should be developed. Greenhouses and protected agricultural houses can be used to cultivate high yielding varieties of vegetables, fruits as well as ornamental plants and flowers.

Advantages of the Greenhouses and protected Agricultural houses
● With the development revolution taking place in Sri Lanka, the land area that can be allocated for agriculture is on the decline. The greenhouses and protected agricultural houses could be utilized to gain a high yield by using less land area.
● The present young generation who are educated are less willing to engage in traditional agriculture. Instead of traditional agriculture, modern agricultural technology would attract young people to engage in agro based industries.
● It is impossible to harvest all types of vegetables or fruits at any time of the year due to unpredictable climate changes and environmental conditions. Greenhouses and protected agricultural houses can be used to avoid this fluctuation.
● There is heavy rainfall from May to mid of August 2018 in the Nuwara - Eliya District, severely affecting the cultivated lands. These types of adverse weather conditions can be avoided by using greenhouses and protected agricultural houses.
● Insect damage for the crop as well as harvest is minimum in the greenhouses and protected agricultural houses. Therefore, we can have insecticide free harvest.
● The possibility of fungal diseases affecting the crops in greenhouses and protected agricultural houses is at a minimum. Therefore, you don’t need to use fungicides and can have a proper yield. Sri Lanka is a country blessed with two monsoons every year. Most of the crops are affected by fungal diseases due to winds of the monsoons and accordingly give a low yield.

Crops that are commonly grown in greenhouse:
Cucumber, Lettuce, Red Bell Paper, Yellow Bell Paper, Green Bell Paper, Tomato, Chinese Cabbage capsium, Strawberry and Ornamental flowers & plants.

Modern greenhouses and protected agriculture houses.
● More harvest could be acquired from vertical cultivation methods with less space. The vertical cultivation method can be used for cultivation in urban cities with less space.
● Irrigation system can be automated to provide plants with water if the need for it arises. Drip irrigation system also can be used.
● In the period of low sun light LED bulbs can be used to have uninterrupted light. Solar panels can be used to store the electrical energy. Red and blue LED bulbs are used to increase the photo synthesis.

Vision
Sri Lanka is a country, where farming can be carried out throughout the whole year. With the increasing of the population and other development work taking place in the country, land availability for the agriculture is on the decline. Sri Lanka is also encountering many adverse climatic conditions. But the demand for high quality vegetables and fruits are increasing.

In order to fulfill this high demand, the new generation should be attracted to agriculture by employing modern technologies in the process. It is very important to introduce modern greenhouse technology and protected agriculture house technology to increase the agriculture productivity to overcome all the challenges leading to a self – sufficient country.

New self – employment opportunities can be introduced through the cultivation of ornamental flowers & plants in protected agriculture house since a high demand exists for ornamental flowers & plants.

Although an additional cost has to be borne initially for cultivation in green houses and protected agricultural houses, the said cost can be overcome through high quality yield.

Chandana Peiris
Research scientist
Arthur C Clark Institute for Modern Technologies
Are our Food and Services Safe?

Look for SLAB “Accreditation”

Accreditation scheme for Inspection Bodies is based on the standard ISO/IEC 17020. This scheme provides a formal recognition to an inspection body for its services for integrity and reliability.

Accreditation is important because it helps determine if an institution (or a product) can be trusted to meet standards of quality and safety. Accreditation helps ensure that the products and services of accredited testing laboratories are reliable and that they can be trusted by consumers.

The Accreditation scheme for Inspection Bodies is based on the standard ISO/IEC 17020. This scheme provides a formal recognition to an inspection body for its services for integrity and reliability. Organizations required to conduct various types of inspections for regulatory purposes are accredited under this scheme.

With accreditation, we can attract more foreign buyers for our products. More foreign exchange! New areas for accreditation are arising globally such as for organic food and educational programmes ranging from diplomas to undergraduate and postgraduate curricula. With technology developing and spreading in leaps and bounds, we encounter new fears. Every technology, whilst providing enormous advantages to mankind, has ended up in weapons to maim and kill people. A future Nuclear-Chemical-Biological hybrid weapon will tear this world, into smithereens! Our only home! We need to be careful.

Safety First!
Investigations and Analyses

Investigations into crime scenes vary depending on the type of evidence. For example, in a murder case, the investigation may involve physical evidence such as fingerprints, DNA, and blood evidence. In a fraud case, the investigation may involve financial records and electronic evidence.

Investigations are conducted by trained professionals such as forensic scientists and detectives. These professionals use a variety of techniques to analyze the evidence and link it to potential suspects.

The Role of Accreditation

Accreditation is a process by which organizations are evaluated to ensure that they meet certain standards. In the context of the amusement industry, accreditation is important to ensure the safety of the amusement park.

There are many different types of accreditations that are available. Some examples include the American Society of Consultant Pathologists (ASCP), the National Association of Medical Examiners (NAME), and the American Board of Pathology (ABP). These organizations evaluate the qualifications and performance of individuals and organizations to ensure that they meet certain standards.

The Role of Accreditation in Amusement Parks

Accreditation is important in the amusement industry to ensure the safety of the rides and attractions. Accreditation involves the evaluation of the amusement park's management, operations, and safety procedures. It also involves the inspection of the rides, equipment, and facilities.

The benefits of accreditation include increased trust and confidence in the amusement park, reduced risk of accidents and injuries, and improved operational efficiency.

The Role of Accreditation in Amusement Parks

Accreditation is an important part of the management of amusement parks. It ensures that the parks meet certain standards and are safe for visitors. Accreditation involves the evaluation of the park's management, operations, and safety procedures. It also involves the inspection of the rides, equipment, and facilities.

The benefits of accreditation include increased trust and confidence in the amusement park, reduced risk of accidents and injuries, and improved operational efficiency.

Addressing the Issue of Amusement Park Accidents

There are many countries that have established regulations to ensure the safety of the amusement parks. These regulations cover a wide range of topics, including design and manufacture, operation, maintenance, and safety inspections.

The regulations are designed to ensure the safety of the amusement park visitors. They require the amusement park operators to follow certain procedures and processes to ensure the safety of the rides and attractions.

For example, the regulations may require the amusement park to conduct regular safety inspections and tests of the rides and equipment. They may also require the amusement park to have trained personnel on staff who are responsible for monitoring the safety of the rides and attractions.

The regulations are enforced by government agencies and are designed to ensure that the amusement parks meet certain safety standards. Visitors can have confidence in the safety of the amusement parks when they follow the regulations and policies established by the government agencies.

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One of the major challenges in the public sector of Asian countries faced today is around 50% of children suffers from malnutrition related problems and around 70% of the elderly population is victims of Non Communicable Diseases (NCD’s). The prevailing number of NCD’s in Sri Lanka is rapidly increasing and according to health surveys around 75% deaths are due to these NCD’s. NonCommunicable Diseases include diabetes, cancer, high blood pressure, heart attacks, chronic obstructive pulmonary disease and high obesity.

It has been revealed that the main causes for NCD’s are the increase in work related lifestyle changes, shaky ecological factors, urbanization, lack of exercise and the changes in the food pattern. Many scientific publications, surveys and data have been reported that there is a strong relationship between changes in diet pattern and NCD’s. This is mainly due to the consumption of refined wheat flour products, consumption of instant or junkfoods and reduction of intake of fiber enriched foods. Consumption of fiber enriched foods can be introduced as a safe pathway for avoiding NCD’s. Those diseases can be reduced by consuming whole grain cereals and legumes and fresh fruits and vegetables. Recent research have been found that phyto-chemicals which contained in seed coat of legumes and whole grains such as polyphenolic compounds, phytosterols, fibers, phytates and pigments have an ability to protect from those diseases.

Consumption of more starchy foods, sugar and oil-rich foods are the main causes for NCD’s and consumption of fiber enriched foods can lead to protection from those diseases. In the digestion process, starchy food is converted into the simple sugars which rapidly absorbs into the blood stream and causes to rapid increase in blood glucose level known as Glycemic Index (GI). Usually, Sri Lankan’s daily fiber intake is about 18.1 grams, which is lower value than the recommended value given by World Health Organization (WHO) that is 28-36 grams per day. Naturally, fiber rich foods are fresh leafy vegetables, fresh fruits, whole grain cereals and legumes. Cereals include red rice, sorghum, millets, corn and legumes include cowpea, green gram, soya bean, pea and gram etc. Legumes contain more protein (~25-40%), fibresand indigestible resistant starch which act as a growing source for micro-organisms.

However, more attention was paid to fiber rich foods and its safety after the 1970s. Presently, many of the cereal based products are formulated using wheat flour (100%). The reasons for the popularity of wheat flour based foods are due to availability of raw materials, convenience, appropriate texture and softness. The research team at Food Technology Section ITI focused on multi-grain products because of their nutritional and health promoting functional properties. The incorporation of legumes to cereal based products improves the quality of the protein and completes the essential amino acid profile. Findings of the research have shown that whole grains increase the fiber content of the product and reduce the blood glucose level (GI). However due to the coarse nature and lack of softness of the whole multi grain products, these products are not so popular among the general public.

Currently, several multi-grain products have been prepared by the Food Technology Section of ITI using rice, millets and sorghum as cereal based raw materials and green peas, gram and soya bean as leguminous raw materials. Multi-grain Noodles, crackers and flakes mixes are examples for new products.

<table>
<thead>
<tr>
<th>Nutrients and glycemic value</th>
<th>Multi-grain Cracker</th>
<th>Multi-grain Noodles</th>
<th>Multi-grain Flakes mix</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy (k cal )</td>
<td>451.56</td>
<td>355.54</td>
<td>377.27</td>
</tr>
<tr>
<td>Protein (%)</td>
<td>11.80</td>
<td>20.69</td>
<td>21.60</td>
</tr>
<tr>
<td>Fat (%)</td>
<td>14.80</td>
<td>0.58</td>
<td>4.35</td>
</tr>
<tr>
<td>Mineral (%)</td>
<td>2.52</td>
<td>2.13</td>
<td>5.34</td>
</tr>
<tr>
<td>Fiber (%)</td>
<td>3.91</td>
<td>9.71</td>
<td>15.04</td>
</tr>
<tr>
<td>Carbohydrates (%)</td>
<td>67.79</td>
<td>66.89</td>
<td>62.93</td>
</tr>
<tr>
<td>Glycemic Index (GI)</td>
<td>57.28</td>
<td>31.00</td>
<td>33.54</td>
</tr>
</tbody>
</table>

Note: The nutrient values have been stated as grams in the 100 grams (dry weight basis) and Glycemnic index is based on laboratory tests.

Further findings of the research have been revealed that the protein and fiber contents of these multi-grain products are higher than the wheat flour based products which already existin the market. The Glycemic Indices (GI) of these products are lower than that of wheat based products in the market and those products can be introduced as low GI products. However multi-grain crackers have shown an intermediate GI value.

Dr. H. M. Theja Herath
Principal Research Scientist
Food Technology Section
Industrial Technology Institute
**Healthy food for a Quality life**

Industrial Technology Institute (ITI) had come up with a technology of nutritious and healthy product a “Nutritious Scone” / Flat bread type with special features. It is a smart, convenient, ready to serve bakery product specially designed to contain high nutritional value with low added sucrose. This product can be introduced as a “High Energy Food” or “Energy Provider” according to the existing Sri Lankan guidelines. Besides, this nutritious product contains considerable amount of protein that is more than one third of the Recommended Daily Allowance (RDA) value of protein for children (Food Labelling and Advertising Regulations 2005). Further said product can be introduced as a “low added sucrose product” (Sucrose < 5%) and as a supplementary food for children and adolescents.

A team of scientists, Dr. Theja Herath, Principal Research Scientist and Ms. Yashora Ransilu, Technical Assistant of the Food Technology Section, ITI developed the nutritious Scone. This invention won Silver Medal in the Sahasak Nimavum -2018, National Inventors Exhibition and awarding ceremony. Dr. Ilmi Hewajulige, Senior Deputy Director, headed by the Food Technology Section successfully overcomes the challenge of transferring technology to the mega industry by convincing the future demand.

The idea of product development is based on the unavailability of nutritious and healthy products in the local markets. Malnutrition is one of the most prevalence nutritional disorders in Sri Lanka and around 60% of children are under nutrition. It is mainly caused due to the inadequate and unbalanced dietary intake of nutrients into the body. The most of the children are consuming non-nutritious and unhealthy diets made of 100% wheat flour available at local markets. Those products generally contain high sugar and fat contents and they will cause adverse effects to the health status of children. Normal Scone/flat bread available in some markets are tasty, ready to serve bakery product which are made out of wheat flour and fat with sugary toppings. It is a non-nutritious and unhealthy product with much popular among urban population. The newly invented nutritious Scone/flat bread relates to reformulation of composition of normal Scone incorporating majority of legume flour (mung bean /soya bean) containing high protein, cereal flours (corn, wheat), sesame, milk powder and dried fruits to make a product nutritious and tasty. Further this product is with high nutrition value and suitable as a supplementary food for children and adolescent who are affected from under nutrition. Nutritional analysis of nutritious Scone showed, Energy 436.03 Kcal, Protein 16.46 %, Fat 19.07 %, Fibre 2.95 % and Total sugar 11.43 %. Further product is modified to contain low moisture content and low water activity (aw) for extension of shelf life.

**ARE YOU TOO A “TEXT NECK” VICTIM?**

What is TEXT NECK?  
TEXT NECK or TECH NECK is a posture associated medical condition that many mobile phone users suffer nowadays. Although many do not pay their attention to this, it is a rooted syndrome for many health problems.

The mobile phone is the best friend who is always used to use. Whether you are at home, bus, train on the street or even a restaurant, simply everywhere we are going the mobile phone is in use. Similarly, the computer. Always we are watching the screens. Sometimes we are in front of a computer for a long time in the same position unknowingly.

The average time of an individual’s mobile phone usage is around 3 to 4 hours per day. It is 1/8 of a day, and if we eliminate 6 hours for sleeping is a 1/6 of awake time per day.

The problem is that when we are on the screen for a long time, we are unknowingly straining the muscles supporting our spine. Generally head of an adult is weighing 4 to 5 kg. When you tilt your head forward, your neck muscles have made an extra effort to keep it in position. In other words, to keep in balance your 5kg of the head when you tilt your head 45 degrees front, the work neck muscles are doing is equal to holding 25kgs on your neck. You may not be aware of this at once. But if you remain the same for a while, you will feel the pain.

### How to avoid this?

It is very easy:

1. The screen of your mobile phone should always be level or slightly below your eye level. If you feel pain your hands, you can use a holder for your tablet or mobile phone. Mobile phone, tablet holders, and laptop stands are cheaply available in the market nowadays.

2. Sit down in a comfortable position to use the laptop/mobile. Keep your shoulders relaxed. Place your elbow on the arm of the chair or on the table, which does not stress you to use your laptop/mobile easily.

3. A chair with a headrest and lumbar support is better.

4. While you are working, do the lean back of your neck and do the chin tucks from time to time.

5. Don’t sit in the same position longer than half an hour. Stand up and walk a little to change your position.

6. There are mobile phone applications which will give you real-time feedback of your posture you can take care of your postures all the time by using these applications. By following these small, easy tips, you will be able to avoid text neck syndrome effectively.

Dr Thilanka Abeysekara
Asteroids and Comets that could pose a threat to the Earth

The effects caused by the asteroids or comets to the earth have been reported from about 65 million years ago. Although the end of the Cretaceous era and the beginning of the Paleozoic Era is still a scientific mystery. It is believed that a very large piece of rock or a comet would have been the cause. The 180km diameter Chicxulub crater in Mexico and the extinction of the Dinosaurs show a certain link, thus the notion that “the extinction of the dinosaurs was caused by meteor or comet colliding with the earth” cannot be ruled out.

Then who will be the second? Human being? Will human being’s fate be the same? Compared with the dinosaurs era human beings are living in a highly scientifically and technologically advanced era. Although we know many things about meteorites and comets, we should all be somewhat aware of the potential catastrophes of this phenomena. Due to importance being accorded to this, the United Nations has declared the 30th June of every year as the International Asteroid Day. The reason for choosing 30th of June as the International Asteroid Day is to symbolize the caused to the Tunguska region of Siberia, in Russia on 30th June 1908 following a 60 meter meteor crash.

It has been reported, that a number of asteroids have traveled close to the earth recently. These observations have been accomplished with the use of technology and through the centers which have been established for observing these asteroids and determining their orbit. The Catalina Sky Survey is an asteroid observatory established in Arizona, USA for asteroid detection and observation.

Asteroid WC9 was in motion 203,000km from Earth on 15th May 2010. It was about 60-130 meters in size and was larger than Tunguska meteor which collided with the Earth in 1908. Another similar incident was reported on 15th April 2018. An Asteroid named 2018 GE3 was discovered just a day before orbiting closer to the Earth. It travelled 192,200km away from the Earth, which amounts to half of the distance between earth and the moon. It was 48-110 meters in size. Doesn’t this show that irrespective of the科学技术 advances achieved and the number of observatories established, asteroids or comets could still reach the Earth unbeknown to us posing a threat to the mankind? The large meteor which appeared on 18th October 2017 in the Southern sky in Sri Lanka also relates to a similar incident. It was an intriguing phenomena for many people who were unaware of such occurrences. Therefore, it is a timely necessity to gain knowledge and raise awareness with regard to Asteroids.

All the planets including Earth are constantly moving through space. From few centimeters to hundreds of kilometers sized boulders are in constant motion through space. Because of the Earth’s gravitation, medium sized boulders are drawn to the planet earth and eventually are destroyed in the sky by the very dense atmosphere of the Earth. Boulders of considerable size that are 5-10 meters in size may not burn out completely, and unburned particles can fall to the Earth surface. These unburned meteoroids are called Meteorite.

Meteorites are mainly of three types. Stony meteorite, iron meteorites and meteorites which are of a combination of stone & iron. Stony meteorites contain silicates while iron meteorites mainly contain iron. In addition to the iron, heavy metal elements such as Nickel and Lead are also found in Iron meteorites.

It was reported that the fragments of the meteorites which had been visible to Sri Lanka on 18th October 2017 was found in several locations in the southern part of Sri Lanka. It is quite a difficult task to ascertain whether these rocky parts are actually meteorites. However, by a few simple tests it can be determined that these rocky particles have come out of space. It can be confirmed by observing the nature of the surface of these rocks. For example, the surface of a meteorites will have severe burns as shown in the pictures above. Most of the meteorites have iron and are attracted to magnetic fields. Since meteorites contain heavy metals, the density is generally high. The density of the limestone, quartz or granites of the earth is 2g-3g/ cm³ but the average density of ameteorite is about 7g-8g/ cm³. Therefore, when compared the size of a meteorite, its weight is more felt.

These meteorites which have fallen on Earth are priceless. By studying these meteorites, we can find answers for many controversial questions such as the birth of the solar system, life of the earth etc. Therefore, these rocky parts should be accurately identified. If you possess any information regarding these rocky parts, it is important to notify Arthur C Clark Institute for Modern Technology extending your invaluable contribution to vital research on Astronomy.

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The effect of bio weapons

Biological warfare is the use of biological toxins or infections agents such as bacteria, viruses and fungi with the intent to kill or incapacitate humans, animals or plants as an act of war. Biological warfare also known as germ warfare is dangerous and is known as a brutal method to kill your opponents. But this method has been used since the ancient times. According to wikipedia, the earliest documented incident of the intention to use biological weapons is recorded in Hittite texts of 1500-1200 B.C in which victims of tularemia were driven to enemy lands, causing an epidemic. And bio weapons were used in both world war I and world war II. So why are these bio weapons so deadly and harmful to people?

There are five different kinds of infections agents that could be used in warfare and they are bacteria, rickettsiae, virus, fungi and toxins. Bacteria are single cell organisms which cause diseases such as anthrax, brucellosis, tularemia and plague. Rickettsiae organisms can cause typhus and q-fever while viruses can be weaponized to cause venezuelan equine encephalitis. Toxins are the poisons which could be weaponized after been extracted by snakes, insects, spiders, marine organisms or even plants. Biological warfare are used by terrorists as they are economical easy to use and hard to detect. Just think how deadly and brutal this method of warfare is. It is said that the cost of a bio weapon is about 0.05 percent the cost of a conventional weapon and still it can produce the same number of casualties.

If we look at the pros and cons of biological warfare, we can see that efficiency ranks 1st in the list of the advantages. And they can spread quickly and affect one country or a whole continent. Bio weapons are easy to make, use and store. You just need the knowledge for making this and you are on the go. One of the Biggest disadvantages of bio weapons is that it lingers for a long period of time. This also signifies that the longer it stays, the more possibilities for unwanted effects. And it causes a massive amount of collateral damage as well. It spreads easily so it can kill people who are not participating in any conflict. The Biological weapons convention which was signed on the 10th of April 1972 and the chemical weapons convention which was signed on the 13th of January 1993 were some of the measures taken by the responsible officials to stop the usage of bio weapons. The effect of bio weapons on the general public should be considered as both negative and unfavourable.

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