

# Newsletter

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**Nehru  
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## Nation Building after Independence Emphasis on science and technology for development

The process of nation building brought about a realization that science and technology need to be fostered and encouraged in order to contribute to the agricultural and industrial progress of the country as well as to its defence. With this in view, Prime Minister Jawaharlal Nehru introduced the Science Policy Resolution in Parliament on 4th March 1958. The Resolution sought to 'foster, promote and sustain' science education and scientific research - both pure and applied, create a pool of scientific personnel and encourage 'individual initiative' and 'creative talent'. The objective was also 'to encourage, and initiate, with all possible speed, programmes for the training of scientific and technical personnel, on a scale adequate to fulfil the country's needs in science, agriculture industry and defence; and in general, to secure for the people of the country all the benefits that can accrue from the acquisition of scientific knowledge.'

Initial efforts concentrated on building upon what had begun prior to independence by some visionary Indians and that is what is elucidated in the paragraphs that follow.

### Council of Scientific and Industrial Research

Two great Indians, Arcot Ramasamy Mudaliar and Shanti Swarup Bhatnagar, one a statesman and the other a scientist, were instrumental in establishing the Council of Scientific and Industrial Research in 1942. Since independence it has emerged as the largest research and development organization in India with 38 laboratories and nearly 5000 scientists. Its research areas are aerospace engineering, structural engineering, ocean sciences, life sciences, metallurgy, chemicals, mining, food, petroleum, leather and environmental sciences. The National Chemical Laboratory, the National Physical Laboratory, the National Metallurgical Laboratory, the Central Drug Research Institute, the Fuel Research Station, the Glass and Ceramic Research Institute etc. are all constituent members of the Council of Scientific and Industrial Research.

### Tata Institute of Fundamental Research

Homi Bhabha, the physicist, with the support of J. R. D. Tata and financial help from Sir Dorab Tata Trust,

founded the Tata Institute of Fundamental Research in 1945. Initially, it operated from the Indian Institute of Science, Bangalore. Later it shifted to Bombay (now Mumbai) where its new building was inaugurated by India's first Prime Minister, Jawaharlal Nehru. TIFR conducts research primarily in the natural sciences viz physics, chemistry, biology, mathematics and theoretical computer science. After independence, the Council of Scientific and Industrial Research designated it in 1949 to be the centre for all large-scale projects in nuclear research. Today it is one among India's outstanding research centres.

### Birbal Sahni Institute of Palaeobotany

The Birbal Sahni Institute of Palaeobotany (now known as Birbal Sahni Institute of Palaeosciences) is an autonomous institute established in 1946 at Lucknow. It carries out research in the field of planet fossil research and it works in close coordination with various laboratories of the Council of Scientific and Industrial Research, Oil and Natural Gas Corporation, Geological Survey of India and National Institute of Oceanography, Goa.

### Defence Research and Development Organization

It was established in 1958 to undertake research and development for India's armed forces. Headquartered in Delhi, it has 52 laboratories, spread all over India, which are engaged in developing defence technologies covering various fields, like aeronautics, armaments, electronics, land combat engineering, life sciences, materials missiles and naval systems. It is the most diverse research organization.

### Indian Council of Medical Research

It is one of the oldest medical research bodies in the world. The council's research priorities coincide with the country's health priorities such as control and management of communicable diseases, fertility control, maternal and child health, control of nutritional disorders, developing alternative strategies for health care delivery, research on major non communicable diseases like cancer, cardiovascular disease, blindness, diabetes and other metabolic and haematological disorders and mental health research and drug research.

### Indian Institutes of Technology

It was Sir Ardeshir Dalal, a member of the Viceroy's Executive Council just before the dawn of independence, who realized that

the future prosperity of India would depend not so much on capital as on technology. The realization led to the conceptualization of the IITs. A committee headed by Sir Nalini Ranjan Sarkar was set up to prepare a proposal. It recommended the establishment of higher technical institutions in the eastern, western and southern regions of the country. Since Bengal had the highest concentration of engineering industries, the first IIT was set up in that state at Kharagpur in May 1950. The parliament passed the Indian Institute of Technology (Kharagpur) Act on 15th September 1956 declaring it as an institute of national importance. In keeping with the recommendation of the Sarkar Committee, the second IIT was established at Bombay (now Mumbai) in 1958 to serve the western region, the third at Kanpur in 1959 for the northern region and in the same year the fourth at Madras (now Chennai) for the southern region.

It was argued that Kanpur actually came under the central region and therefore there should be one additional IIT for the northern region. This led to the establishment of IIT, Delhi in 1961. The Indian Institutes of Technology Act was suitably amended to reflect the addition of new IITs.

### National Council of Applied Economic Research

It was established as a research institute in 1956. The first Prime Minister of independent India visualized the need for independent institutions as sounding boards for the government and private sector and NCAER was started as a public private partnership. It was funded by government and private industry. Its research focuses on ; 1) growth, trade and economic policy; 2) industry and infrastructure ; 3) agriculture and rural development; 4) poverty, equity and human development.

### Indian Council of Agricultural Research

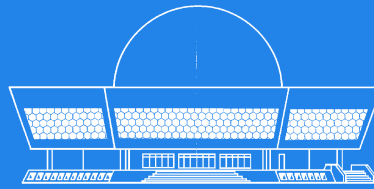
It is an autonomous organization and the apex body for co-ordinating, guiding and managing research and education in agriculture including horticulture, fisheries and animal sciences in the entire country. It has played a pioneering role in ushering the green revolution in India and enhancing the production of food grains, horticulture, crops, fish, milk and eggs.

Since independence, there has been constant effort to establish a modern science and technology infrastructure in the country. Over a period of time much has been done towards that goal and consequently India holds a strong position in terms of advanced technology today.

## What Nehru said....

The growth of India in industry, in technology, in science, and in other ways will benefit not only India but the world at large in promoting peace and co-operative living between nations. Thus, we may bring together our own traditional ideals and modern techniques and have a marriage of the two, and serve ourselves and the world.

*... speech at the inauguration of the second HMT factory, Bangalore, July 28, 1961*



## NEHRU PLANETARIUM

### Meteor Showers

What are meteor showers? Many small pieces of space rock are formed when two large space bodies crash into each other as they orbit the sun. As these smaller pieces of stone-like particles enter the earth's atmosphere, they are transformed into brilliant streaks of light and pass through the sky. These are called meteors. Meteor showers are a celestial event that takes place when thousands of meteors radiate or originate from a point in the night sky.

On the night of November 12/13, 1833 in eastern North America people woke up to see the sky lit up by heavenly fireworks which were actually meteor showers. One of those who witnessed this spectacle was Prof. Denison Olmsted from Yale University who had a deep interest in astronomical phenomena.

On that night, Prof Olmsted observed that the meteors seemed to be originating from a certain point in the Leo constellation. He decided to carry out further research on this spectacular phenomenon. He visited nearby towns to talk to people and to record their impressions and was told that a similar spectacle was witnessed by people in other places too. The estimate was that, in just one hour, numerous meteors were seen.



Prof. Denison Olmsted



In the following year, Olmsted published his findings in the *American Journal of Science and Arts* in a paper titled *Observations on the Meteors of November 13, 1833*. In the report, Olmsted suggested that the meteors may have originated from a cloud of particles in space but could offer no explanation for how that cloud may have formed.

Later, astronomers discovered that every year close to November 13, a number of meteors were seen coming from the direction of constellation Leo in a short span of about an hour. It was also observed that the display of meteors, similar to that of 1833, repeats every 33 years. In due course of time, astronomers discovered something else. They found out that there was a sharp rise in meteoric activity when a comet called Tempel-Tuttle would pass close to the sun every 33 years. By now it was well established that the meteor shower of November was due to the Earth's passage across the orbit of the comet Tempel-Tuttle. The shower was known as Leonid because the radiant lay in the Leo constellation.

Woodcut print depicting the 13 November 1833 Leonid meteor showers

## Meteoric activity and comets

A comet is a mixture of any icy material formed from water, carbon dioxide, carbon monoxide, methane, and ammonia in frozen form with the exterior of a stony shell. When a comet comes closer to the sun, it spews out icy material by sublimation. Sublimation is a process by which material is converted from solid to gaseous state without going through the liquid state. When the gaseous material breaks the stony shell, fragments or debris of the shell get scattered in different directions. Most of the debris forms the tail of the comet and follows nearly the same path as that of the comet. Eventually, a ribbon of debris is formed along the comet's orbit.

If the orbit of the comet and the earth intersect or lie close to each other, then every year when the earth passes close to or through this point, a surge of the comet's debris enters into its atmosphere and burns out completely as meteors.

The point in the sky from where the meteor shower appears is called the radiant of the shower and the shower is named after the constellation in which its radiant lies.

Every year Halley's comet produces two meteor showers - Eta Aquarids, which appear on May 5/6 and Orionids which appear on October 20/21. Geminids is one of the finest meteor showers as up to 75 meteors per hour can be observed in the sky. This shower shows a



Long exposure photograph of Geminid meteor shower taken on December 12, 2016.  
Pic credit: NASA, Marshall Space Flight Centre, Meteoroid Environment Office

clumping effect which means that for about four to five minutes, there are no visible meteors after which there is a sudden burst of four or five meteors within a minute. The shower is due to what is now called a 'rock comet' named 3200 Phaethon. 3200 Phaethon was once a comet. As explained earlier, every time it visited the sun it lost some of its icy material. Now the comet has completely lost its icy material and no tail forms when it passes close to the sun.

In 2020, Geminid meteor showers are expected to peak on the night of 14/15 December which will coincide with the New Moon. Therefore, it promises to be a spectacular display of celestial fireworks eagerly awaited by night sky watchers.

# INDIAN CLASSICAL DANCE: KUCHIPUDI

Kuchipudi is perhaps the only classical dance form of India which takes the name of its place of origin: Kuchipudi near Vijaywada in the Krishna district of Andhra Pradesh. It is said that the Nawab of Golkonda, Abul Hasan Tana Shah (1672-1687) once happened to witness the Kuchipudi Bhagavatam (the dance drama performed by local Brahmins) and was so pleased that he granted the entire Kuchipudi village to the Bhagavatulu (Brahmin) families. This grant was inscribed on a copper plate which symbolised authority and perpetuity.



Kuchipudi, earlier referred to as Kuchipudi Bhagavatam or Vidhi (street) Bhagavatam, descends from the tradition of Yakshagana, a dramatic presentation of south India especially of Andhra Pradesh. It began as a form in which stories set to music were narrated by a single person. It then evolved into a presentation in which the various characters in the narration were enacted with the help of a chief narrator, the sutradhara. Kalapam, a lyrical drama, which is also a popular component of the Kuchipudi repertoire belongs to this stage of evolution of Yakshagana and its thematic content lies in the quarrel between the two leading

characters of a play. Kuchipudi further evolved into a form where more characters acted out complex stories with a rich variety of song, narrative and dramatic elements.

As Kuchipudi was an all male tradition, the female character of Satyabhama was enacted by a male artist skilful in female impersonation. Till the 1940s the tradition of Kuchipudi was the legacy of a few families of the Kuchipudi village. Many scholars, connoisseurs, gurus and performers contributed significantly to bring this classical dance form national recognition. Ragini Devi, an American, was the first woman to have learnt Kuchipudi from her guru Chinta Venkataramaiah in the 1930s.

Kuchipudi has a strong presence in the Indian diaspora, especially in the USA. In the Second International Kuchipudi Dance Convention held in December 2010 in Hyderabad, 2800 Kuchipudi dancers created a record entry in the Guinness Book of Records by dancing together. However, as is true of any other art form, upholding the standards of performance and teaching will require the constant attention of all dance enthusiasts, particularly the professionals.



Nehru Centre has been privileged to host eminent dancers like Raja and Radha Reddy, Guru Vempati Chinna Satyam and Hema Malini to perform at the Kuchipudi Mahotsav held in 1996.

## Ravindra Mestry

Ravindra Mestry was born in Kolhapur in 1928 in a family of artists. His grandfather, Krishnarao Mestry was an ace craftsman and his father, Kalamaharshi Baburao Painter was a master painter. Kolhapur, once known as 'Kalapur', means 'the city of artists'. For a period of almost first six decades of this century, Kolhapur yielded a number of painters, sculptors, film-makers, musicians, poets and writers. Young Ravindra inherited most of the qualities of his father and he too excelled in painting and sculpture. He also taught painting in a local art school for a few years. His students still talk very highly about him and his way of teaching.

Ravindra Mestry started his initial training with his father, specializing in portrait painting. He joined Sir J. J. School of Art but left after three years to join his father in the casting and production of several monumental sculptures. This helped the younger Mestry to become a sculptor of eminence.

Though accomplished as portrait painters both Baburao Painter and Ravindra Mestry developed their own style of handling the medium of oil painting. Besides the softness of the complexion of his model, Baburao Painter used to pay meticulous attention to drapery and other related objects to such an extent that the onlooker could feel the actual material with its subtle textural beauty. Ravindra Mestry, on the other hand, often went closer to early impressionistic style while creating the illusion of reality with subtle and suggestive brush strokes, yet maintaining harmonious tonal values.

Ravindra's work was mainly dedicated to portrait paintings and the portraits that he executed had a rare charm. His style was similar to that of Dutch portrait painters and his paintings give the impression that they were painted with great passion and love. His paintings titled 'Sulu', 'Shashi' and 'Asha' are remarkable works of art.



Statue of Maharani Tarabai at Panhala

Ravindra was extremely proficient in executing monumental sculptures in bronze too. His two large size sculptures of Baji Prabhu and Shiva Kashid installed in the Panhala fort near Kolhapur give enough evidence of his skill in handling the bronze casting technique. Mestry faced a challenge when he was commissioned to make an equestrian statue of Maharani Tarabai. The horse was to be shown as standing on two rear legs while Maharani was riding. This meant that he had to find the device to balance the entire weight of the body of the horse with rider only on the two legs of the horse. The engineering brain which he inherited from his father came to his rescue as such a difficult installation cannot be achieved without estimating correct mathematical calculations. When asked how he achieved it, Ravindra in his usual modesty just said, "It was a team work."

Ravindra was a man with a unique personality. Quiet, unassuming and always detached from materialistic acquisitions, he had a refined taste for everything that brings happiness in life. J. Krishnamurti and Swami Vivekanand made a lasting impression of their philosophies on Ravindra's mind. Ravindra gradually developed a new vision, the vision to look at everyday life in a way in which very few can even think of.

In his lifetime he produced paintings and sculptures in what was popularly known as the realistic style. He never signed his paintings since he believed that an artist should be known by his work and not by his signature. This gifted son of a gifted father died in 1995.



The sculpture of a movie camera made in memory of his father is a landmark to their house

## UNESCO World Heritage Sites in India

### 12. Elephanta Caves

The Elephanta Caves are located on the island of Gharapuri off the coast of Mumbai. Largely dedicated to Lord Shiva, the caves span an area of 60,000 square feet. Legends suggest that Pulakesin II of the Chalukya dynasty began building them after his victory in a naval battle. Built between 400 AD and 750 AD, these caves are carefully carved out of giant stones made of basalt rock. Several pillars and columns are there to support the unique structure, consisting of two groups of caves- the first is a large group of five Hindu caves, the second, a smaller group of two Buddhist caves.

The most important among the five Hindu caves is the great Cave 1, which measures 39 metres from the front entrance to the back. The main body of the cave, excluding the porticos on the three open sides and the back aisle, covers an area of 27 square meters and is supported by rows of six columns each. The seven metre high statue of Trimurti Sadashiv dominates the entrance to Cave 1. It depicts the three faces of Shiva as the Creator, Preserver and Destroyer, i.e. Aghora or Bhairava (left half), Taptapurusha or Mahadeva (central full face), and Vamadeva or Uma (right half) respectively.

Across the ravine from Cave 1 on the hill on the other side are two Buddhist caves, together with the remains of a stupa and water tanks. It seems the Buddhists were the first occupants of the island. One is a large hall known as Cave 6, or Sitabai's temple cave. The portico has four pillars and two pilasters, which are rectangular columns. The hall has 3 chambers at the back, the central one a shrine and the rest for monks or priests. The hall is devoid of any decoration, except for the door of the central shrine, which has pilasters and a frieze, with the threshold decorated with lion figures. Cave 7 is another small excavation with a veranda, which was probably to be three cells, but was abandoned following the discovery of a flaw in the rock.

The earliest attempts to prevent further damage to the Caves were started by British India officials in 1909. The monuments were restored in the 1970s and were added to UNESCO's World Heritage sites in 1987.



Entrance to Cave No. 1



Cave No. 6



Trimurti

*Further reading at Nehru Centre Library:*

- Elephanta by George Michell; India Book House, Mumbai, 2002  
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"Libraries store the energy that fuels the imagination. They open up windows to the world and inspire us to explore and achieve, and contribute to improving our quality of life."

**Sidney Sheldon**

The above may have been the thoughts of Sidney Sheldon but what better way to describe a library like that of the Nehru Centre for the multiple windows that it opens out for children. It is perhaps the largest public library in Mumbai. Spacious and beautifully laid out, it has the perfect ambience to nurture minds, not only of children but also of adults. Its environs provide the perfect inspiration to spend hours and hours – even a whole day – reading, writing or just day dreaming.

A library is not just a temple of knowledge but a place that provides food for thought. The cool comfort of the Nehru Centre Library is such that it resounds with positive vibes, thus making it a very special place – a must-visit for book lovers.

My association with Nehru Centre Library began seven years ago when I walked in to explore opportunities for writers like me who write for children. I was pleasantly surprised to discover this oasis in a desert – almost describing the dearth of good libraries in the city. This bond has grown stronger with the passage of time. The library has supported a number of my book launches, book readings, even other activities with children such as a nature trail around the campus as part of a Children's Literature Festival and wildlife related workshops. The most encouraging of their activities is to publish a book each year, 'The Book I Wrote,' a compilation of best selected children's stories and poems in conclusion of an inter-school competition. No other library, as far as I am aware, does this.

The lockdown in the past few months has, sadly, put a sudden stop to my visits to the library. I do miss the warm, smiling, welcoming faces of the staff.

I do hope this iconic place of Mumbai once again opens its doors, implementing due precautions of course. Dear Nehru Centre Library, I am waiting.....

**Katie Bagli**

*Children's author and story teller*

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