

Capsule

JULY
SEPT
1990

18



ELECTRONIC GALLERY

BIT M

High in educational, motivational and entertainment value, the new 'Electronics Gallery' at Birla Industrial and Technological Museum, Calcutta features a bright array of exhibits dealing with the principles of Electronics. One of the special characteristics of this gallery is that most of the principles of Electronics have been explained through a number of analogies which people are either acquainted with or experience everyday. The gallery begins with the 'History of Electronics' which depicts the chronological development of Electronics right from the discovery of electrical Rectification, Amplification, Oscillation, Semiconductor, Digital Electronics, Micro Electronics, Medical Electronics, Computer and Robotics form some of the sections.

In the section dealing with Rectification, the exhibit 'Diode - The Rectifier' enables one to manipulate the arrangement of diodes and to study the pattern of change in output. A water analogy, with hydraulic valves substituting for the diode makes the concept clear in 'One Way Flow'.

Exhibits on Amplification facilitate interaction with common devices like slide projector for optical magnification, pantograph for mechanical enlargement and transformer for electrical amplification. Most spectacular, however, is the 'Funny Tree' which can be lit up with rythmical clapping.

A major part of the section 'Oscillation' deals with exhibits on low-frequency oscillation - oscillation that is experienced frequently. Here the visitors have the opportunity to manipulate different parameters in exhibits and create different types of oscillations. Exhibits on forced oscillations and reflection of waves are rather interesting. In the exhibit, 'Oscillation that Decays' one can change a capacitor and allow it to discharge through a resistance in order to produce oscillation. Curious visitors also have the opportunity to verify the role of capacitors and resistors in damping. The exhibit 'How An Oscillator Works' explains what exactly goes on inside the system before it develops sustained oscillation.

The exhibit 'Frequency Modulation' exposes the visitors to the subject through an interesting mechanical



analogy. Another exhibit explains modulation in an experimental set up where visitors can watch on the screen and verify the relationship between the carrier, modulated and modulating signals.

In the Micro Electronics section, the story of how an I.C. is made from sand is portrayed through a number of interesting demonstrative exhibits. With the help of several audio visual aids, one has the rare opportunity of discovering 'What is inside an I.C.'

Advantages of using electronics in monitoring and interpreting basic parameters of human body are a great contribution of Medical Electronics. At 'Dr. Know's Clinic' the visitor gets to know and update his knowledge about the functions of different vital organs of the body. Here the visitor has the rare opportunity of measuring blood pressure, pulse beat or lung capacity all by himself.

The gallery also features a Robot which performs a variety of tasks on com-

mand from his master - the visitor. A large robotic arm can be controlled for placing Brahma's discs, one above the other. While interacting with this machine the visitor learns the difficulties of man-machine interface. Simultaneously, a robot connected to a computer picks and places appropriate letters to form the name of the visitor who has instructed the robot to do so. This exhibit helps the visitors to understand how a machine-machine interface works flawlessly.

If computer is the end, Digital Electronics is the means. But if Digital Electronics is the end then Gates - NOT - AND - OR are the means - the building blocks - the stepping stones. Starting with Binary Numbers (the basic tool for mathematical computation) the exhibits in this section unfold the mystery of what goes on inside a computer.

The gallery, ready to receive visitors is scheduled to be opened sometime during the 31st anniversary of the museum.





Following the United Nations conference on "Human Environment" held at Stockholm in 1972, June 5 was declared as the World Environment Day. The science centres and museums under NCSM observed the day this year by organising multifarious programmes tailored to kindle environment consciousness among the citizens of the country. Here is a brief account of the activities organised by the centres.

BIRLA INDUSTRIAL & TECHNOLOGICAL MUSEUM, CALCUTTA started the day with a programme called 'Naming the Trees'. At Rabindra Sarobar, members of the museum's Nature Club attached identification plates on the trees for the benefit of the visitors to the lake. A sit and draw competition on 'Earth - Our Planet' was organised with the participation of a large number of schoolchildren.

A novel attraction were the 'Patuas' (scroll-painters) who came from the distant rural regions of West Bengal. They were exposed to popular lectures on conservation of environment so that they could carry the message of the celebration programme to the rural grassroots. On the spot, however, they painted scrolls and composed songs which created a great deal of excitement among the onlookers.

VISVESVARAYA INDUSTRIAL AND TECHNOLOGICAL MUSEUM, BANGALORE organised a special slide lecture on 'Birds of Karnataka' which was delivered by Shri S. Sridhar, President, Bird Watchers Field Club of Bangalore. The lecture was attended by students who had enrolled earlier in the vacation hobby centre on Nature Study. These students were also taken for a

COUNTRYWIDE CELEBRATION OF WORLD ENVIRONMENT DAY

one day field trip to the Ranganathittu Bird Sanctuary.



'Envirofocus' - a college students organisation in Bangalore held an exhibition on 'Man and the Biosphere'. The exhibition was kept open from June 5 to June 7, 1990.

REGIONAL SCIENCE CENTRE, BHUBANESWAR, Nature and Wild Life Conservation Society of Orissa and Pathani Samanta Planetarium jointly celebrated the 18th World Environment Day by organising a series of educational and awareness programmes which comprised a quiz contest on 'Nature and Wild Life', a slide show on 'Flora and Fauna of Orissa' and a sit and draw competition for schoolchildren.

SHRIKRISHNA SCIENCE CENTRE, PATNA, Bihar Council on Science & Technology and Facon De Parler Debating Society, Patna, were partners in celebrating the World Environment Day. On the occasion, a temporary exhibition of posters on 'Man and Environment' was held and a Debate Competition on 'Floods are only Man-made Disasters' was organised with the participation of 30 competitors.



REGIONAL SCIENCE CENTRE, LUCKNOW organised a lecture on 'Environmental Problem in Uttar Pradesh with Special Reference to World Environment Day' on June 5, 1990. The lecture was followed by distribution of prizes to the winners of an essay competition held earlier. An audio visual show on environment was also held the same evening.



The scroll-painter at BITM

PROGRAMMES

Inauguration of Gallery of Salar Jung's

Date : May 10, 1990

Venue : Salar Jung Museum, Hyderabad

Celebration of 22nd World Telecom Day

Date : May 17, 1990

Venue : District Science Centre, Gulbarga

Organised by :

Gulbarga Telephones and District Science Centre, Gulbarga

Opening of an exhibition on The Wonderful World of Birds

Date : June 5, 1990

Venue : The National Museum of Natural History

International Conference on New Trends in Geometric Function, Theory and Applications

Duration : July 26-29, 1990

Venue : Madras

Training Course on Rehabilitation of Degraded Arid Land Ecosystems

Duration : September 10-24, 1990

Venue : Jodhpur

Organised by :

Central Arid Zone Research Institute

International Seminar on Water Erosion and Sedimentation Transport Processes

Duration : October 9-12, 1990

Venue : Dehradun

Sponsored by :

UNESCO

International Conference on Museums and Environmental Issues

Duration : March 20-25, 1991

Venue : Beidiah, China

Organised jointly by :

ICOM Committee for Natural History Museums and Chinese Association of Natural Science Museums

NEW EXHIBITS

BIRLA INDUSTRIAL AND TECHNOLOGICAL MUSEUM, CALCUTTA

A gigantic Robotic Arm which can be manipulated by visitors is one of the most interesting exhibits in the Electronics Gallery, BITM. When fully stretched it has a reach of 52". It has five joints - base, shoulder, elbow, wrist (pitch & roll), and grip. The base axis is vertical and the base joint moves the robo-arm on the base round the vertical axis (-90° to $90^\circ = 180^\circ$ rotation). The shoulder axis is horizontal and allows the shoulder arm to move up and down by rotation around the joint. Similarly, for the elbow joint, the elbow axis is horizontal and allows up-and-down movement of the elbow arm. The arm joints allow a rotational movement along a vertical axis and also a bidirectional



The gigantic robo-arm

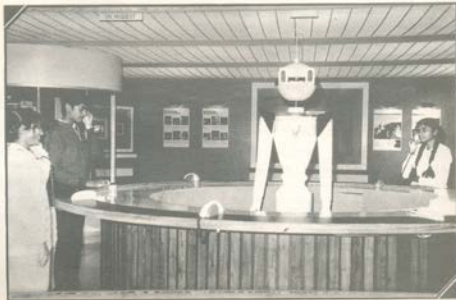
(forward and back) swing along a horizontal axis. The arm therefore has two 'degrees of freedom'. Two other horizontal axes are there for opening or closing of the grip. All these movements can be controlled by visitors through a set of switches and consequently, the robot will do the task of picking and placing objects.

BIRLA MUSEUM, PILANI

In its new Electronics Gallery, Birla Museum, Pilani, has added a micro-processor-based robot which is nicknamed YAM (Yantrik Manav). It is in the form of a full-size human being and it goes about in the gallery greeting and shaking hands with the visitors and also talking to them about the wonders of Electronics. The star attraction has been designed and fabricated in the

Museum's own workshop. There are plans to add many more exciting actions and movements so as to make the robot still more spectacular and participatory in nature. The new gallery has other attractions too; a computer-based exhibit for quiz, a musical fountain and an audio-visual presentation of the history of Electronics are some of them.

YAM - the friendly robot



25 YEARS OF MOBILE SCIENCE EXHIBITION

On a November morning in 1965, an ordinary truck entered the premises of the Ramkrishna Mission School, Narendrapur - a few miles away from Calcutta - and soon after created a sensation among the school children who thronged round the vehicle to see what was to follow. It was not a familiar experience for them: display stands were unloaded from the vehicle and arranged in the schoolhall, cabinets were mounted on the stands and electrical connections made; within half an hour, a spectacular show of exhibits dealing with the working principles of such common electrical appliances as lamps and fans, heaters and pumps, radios and telephones unmistakably captivated the attention of the students and the teachers alike.

'Our Familiar Electricity' was the theme of this very popular exhibition which was the outcome of extensive investigations carried out at Birla Industrial & Technological Museum, Calcutta, on how to familiarise the rural masses with

Science Exhibition (MSE) meet with a resounding success.

However, it was not long before the truck was replaced by the 'museobus' - a self-contained mobile science exhibition unit with inbuilt shelves for housing exhibits. The first museobus was designed and developed at BITM, Calcutta and the second at Visvesvaraya Industrial and Technological Museum, Bangalore. The nationwide proliferation of the mobile science exhibition, however, may be attributed to the escalation of the science centre movement led by the National Council of Science Museums. Presently, 14 such museobuses are reaching out even to

celebrate its Silver Jubilee by organising a massive festal congregation of all the units during November 17-25, 1990 at the original site where the first travelling exhibition was held 25 years back. According to plans, all the museobuses will start from their parent museums and tracing different routes will converge at Calcutta by November 15, 1990. En route, a museobus with an accompanying team of museum personnel will stop at different sites for holding pre-arranged programmes. In order to cover a greater majority of the population, the distance between two consecutive sites will not be more than 150 kms. Each museobus will stay at a site



The first museobus Venus created a deal of excitement in a village in West Bengal



The first exhibition at Narendrapur: a modest beginning

the complexities of science. Various circulatory and travelling exhibition systems then in vogue in the developed countries, particularly in the USA, as well as the UNESCO's travelling science exhibitions were a source of inspiration to the curators and engineers of the museum. Needless to say, it was rather heartening for them to see the first Indian experiment with the Mobile

the remotest corners of the country in a path-breaking approach to disseminate science. Previously the exhibitions were largely based on curriculum-oriented themes like 'Mathematics through Fun', 'Light and Sight' and 'Transformation of Energy'. In course of time, as the mobile science exhibition extended its service to the rural community living afar, appropriate topics like 'Water: The Fountain of Life', 'Agriculture', 'You and your Environment' and 'Food and Nutrition' were introduced. The year-round, well-organised programmes of the MSE soon became a hit among the rural and the suburban populace.

Today, as the Mobile Science Exhibition steps into its 25th anniversary, the science museums and centres under the National Council of Science Museums can not but take pride in the history of the MSE and its educational attainments. The Council has decided to

for a couple of days during which local organisations dealing with popularization of science will organise supporting programmes comprising science yatra, science drama, science quiz, display of anti-superstition posters and popular lectures on science. The portable, inflatable dome planetarium introduced a few years back is expected to be a major attraction among the local visitors.

The fleet of the museobuses will meet at Calcutta where a Gramin Mela (Village Fair) will be organised to add to the attraction of the science carnival.

Further details of the programme will be published in the next issue of Capsule. In the meantime, the science museums and centres, it is expected, will make preparations for ensuring spontaneous participation of people from all social strata.

COLLABORATION

TRIENNIAL PROGRAMME OF INDO-US SUB- COMMISSION ON EDUCATION AND CULTURE

The Indo-US Sub-Commission on Education and Culture met at Delhi during March 20-30, 1990 and approved of a triennial programme (1990-93) in the area of science museums. According to decision, planning and development of travelling exhibits on 'Information Revolution' and on 'Unity of Forces', 'Mathematics', or 'Fighting Superstition and Obscurantism' will be undertaken during this period.

Intensive training programmes for exhibit designers from India and other developing countries will also be organised. Special emphasis will be laid on development of hardware and software multi-media Projection Systems, computer aided exhibit design and documentation, and micro-processor controlled exhibits. Experts from USA and India will conduct the training courses.

The triennial programme also includes development of low cost learning kits on areas identified through Indo-US workshop in USA.



Indo-US Sub-Commission on Education and Culture met at Delhi in March this year.

INDO-AUSTRALIA WORKSHOP ON 'HUMAN BIOLOGY - PUBLIC HEALTH AND NUTRITION'

An Indo-Australia Workshop on "Human Biology - Public Health and Nutrition" was held at Thredbo, Australia during April 2-5, 1990 with the participation of 26 representatives from different science centres of India, Australia and New Zealand. The Directors of Birla Industrial and Technological Museum, Calcutta and Nehru Science Centre, Bombay, participated from India.

The objective of the workshop was to develop about 22-30 interactive exhibits based on the theme 'Public Health and Nutrition'. After preliminary discussions, the participants were divided into 4 groups each having a long brainstorming session in order to delineate the area in which exhibits could be developed. Each group prepared a design layout of 6-8 exhibits, along with suggestions for write-ups and graphics. The ideas of each group were then presented in The General Plenary Session on April 5, 1990.

The workshop was hosted by National Science and Technology Centre, Canberra.

WORKSHOP ON REFLECTIVE TELESCOPE CONSTRUCTION

The Karnataka Rajya Vijnana Parishat (KRVP), Association of Bangalore Amateur Astronomers and Visvesvaraya Industrial and Technological Museum jointly conducted a workshop on 'Reflective Telescope Construction' during

October 3-18, 1989, at VITM, Bangalore. The objectives of the workshop were to popularise telescope as an instrument of night sky observation; to involve teachers and students in the art of building reflective type telescope; to offer books and slide shows on telescope; to inspire teachers in the workshop to continue astronomical studies in their own regions; and to make every effort to eradicate superstition.



Mirror grinding in the workshop

The workshop was inaugurated on October 3, 1989, by Prof. C.V. Visveswara, Director, Nehru Planetarium, Bangalore. He explained the salient features of the solar system and highlighted the necessity of doing away with superstition about eclipses. Sri Nagarajan presided over the function.

Special lectures were delivered on basic astronomy and observational techniques as well as on 'The Night Sky', 'Comets', 'Telescope Making' and 'Galaxies'.

18 reflective telescopes were constructed and distributed among the 18 participating groups. Fabrication of telescope mount and assembling of the telescopes were carried out by the participants. They were also trained in the art of testing mirrors.

Each group was given a copy of each of the KRVP books - 'A Guide to the Night Sky', 'How to Build a Telescope' and 'Clusters, Nebulae and Galaxies'.

Dr. J.C. Bhattacharya, Director, Indian Institute of Astrophysics spoke briefly on the large telescopes at Kavalur.



NCSM IN ACTION

BIRLA INDUSTRIAL AND TECHNOLOGICAL MUSEUM, CALCUTTA

Children who attended the public demonstration programme called 'Have Fun with Paper' at BITM on February 28, 1990, were thrilled to see paper dolls dance under a glass plate rubbed with flannel; closed petals of a paper bud blossom into a flower when dipped in water; a paper spiral rotate under the influence of a burning candle; and a five rupee note come out undamaged even when ignited. Bernoulli's Principle was demonstrated by opening the lid of a card-board box by blowing air along its top surface.

VISVESVARAYA INDUSTRIAL AND TECHNOLOGICAL MUSEUM, BANGALORE

VITM, Bangalore, Indian Institute of Science, Karnataka Soaps & Detergents, Food Craft Institute and Central Handicrafts Design Centre jointly celebrated the Museum Week during May 18-25, 1990 by organising special demonstration programmes on glass blowing, clay modelling and soap making.

For schoolchildren were organised a quiz contest, a sit and draw contest and a competition called 'Guess by Action'.

During summer vacation, a Rocket Modelling programme was organised and test flights were carried out on April 26, 1990.

NEHRU SCIENCE CENTRE, BOMBAY

Every year during vacation, students from schools of Bombay undergo Creative Ability Courses in the disciplines of Physics, Chemistry, Life Science, Art and Craft, Electronics and Computer. This year also, the course was conducted in batches from May 1-11 and May 15-25, during which some 700 projects were completed.

As a part of the 'Museum Week' Celebration, seven film shows on 'Conservation of Environment' were organised by the Centre from May 18-25, 1990.

RAMAN SCIENCE CENTRE, NAGPUR

During Museum Week, the centre organised plant identification programme, sky observation programme and science film shows on 'Universe', 'Man-The Incredible Machine', and 'Volcanos Earthquakes and Earth Movements'.



SHRIKRISHNA SCIENCE CENTRE, PATNA

The first Bihar State Aeromodelling Championship programme was organised jointly by Shrikrishna Science Centre, Patna, Adventurer's Aero Club & N.C.C., and 1st and 2nd Sqd., Bihar, at Gandhi Maidan, Patna, on April, 7, 1990. Participants presented a wide variety of aero-models which won a deal of appreciation from the 10,000 visitors who attended the programme. In addition to the flying show and the display of aero-models, a parachuting programme was also organised.

The centre observed the Museum Week from May 18-25, 1990 during which was organised a science quiz contest



for the local school children, and a Food Adulteration Testing Demonstration in which simple testing of adulteration in food stuff like ghee, edible oil, milk, pulses and spices were demonstrated to the audience.

The centre celebrated its Anniversary Week from April 14-20, 1990 by holding a special film show and a cooking competition cum recipe demonstration programme. Prizes and certificates were awarded to the winners.

A seminar on Visual Art and Science was organised on May 22, 1990.



DISTRICT SCIENCE CENTRE, PURULIA

A training programme on 'Pressed mud brick making and low cost housing' was held at District Science Centre, Purulia from 24th to 26th April, 1990 in collaboration with District Industries Centre, District Rural Development Agency and Indian Institute of Science, Bangalore. Scientists from ASTRA, Indian Institute of Science, Bangalore, came to train beneficiaries from the rural areas. The whole programme was financed by District Rural Development Agency. The machine for making pressed brick was designed by ASTRA.

WE NEED

CAPSULE, is looking forward to your sending by July 31, 1990 publication materials for the 19th issue. Please send short notes, photographs, problems, suggestions, cartoons and puzzles.

DISTRICT SCIENCE CENTRE, DHARAMPUR

For DSC, Dharampur, April 27, 1990 was a day of great rejoicing. The inauguration of the portable 'Taramandal' in the Children's Hall and several other programmes like film shows and sky observation programmes were held to mark the occasion of its 6th anniversary.



CAREER OPPORTUNITIES

Applications are invited for the posts of (i) Editor and (ii) Editorial Assistant in our Publications Unit. For detailed information, please write to National Council of Science Museums Sector-V, Block-GN, Salt Lake City, Calcutta-700 091, with a self-addressed envelope (24 cms x 10 cms) with stamp worth Re. 1/-.



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