

A NEW
SCIENCE
CENTRE
COMING UP AT
THE CENTRE OF
THE COUNTRY

JUL-SEP/1987

Capsule 6



NCSM SPEAKS

Whatever the occasion may be : advent of Halley's Comet, launching of Space Probes, celebration of National Science Day or World Environment Day—every scientific event is taken up by the Science Museums and Centres of NCSM, to popularise science, to enhance science-consciousness. Multiprong is the action programme of these Museums and Centres, and yet well-coordinated. New Science Centres in different parts of the country come up rapidly ; gallery planning, exhibit-fabrication and training of personnel commence at the Central Research & Training Laboratory simultaneously. New educational and extension programmes developed in one Museum are promptly passed on to other Units for concurrent implementation ; exhibitions coming to NCSM from abroad or going abroad from NCSM under International exchange programmes are circulated through maximum possible sites, for the benefit of maximum number of people.

RAMAN SCIENCE CENTRE, NAGPUR

It has been given a thorough face-lift. Indeed, something more than a face-lift, in terms of value-addition. The old municipal dumping ground opposite to the lake Gandhi Sagar at the heart of Nagpur is being converted into a Science Centre, named after Prof. C. V. Raman, the great physicist of India. Stink and filth which one usually shrinks away from, has given way to the delight of funful learning. Above all, an inviting place of recreation for people of all age-groups. 14 acres of sprawling greenery, with a lush carpet of grass, trees, shrubs and bushes, ponds, garden pathways, aviary, animalarium, and interspersed with them interactive exhibits on scientific phenomena—that is precisely what the Science Park is.

On April 11, 1987, Shri P. V. Narasimha Rao, Union Minister of Human Resource Development, dedicated the Science Park and the Mobile Science Exhibition of Raman Science Centre to the people of Nagpur. Among the dignitaries present on this occasion were His Excellency Shri Shankar Dayal Sharma, Governor of Maharashtra ; Shri Ram Meghe, Minister of Education, Govt. of Maharashtra ; and Dr. S. Varadarajan, Chief Consultant, Planning Commission.

(Continued in page 3, col. 1)

Capsule disseminates all the news far and wide.

Your Organisation and activities are most welcome to take a place in this newsletter. Please send reports along with photographs on your programmes. Room for all is assured.

Clockwise :—

1. A family at the "Worm Wheel" exhibit.
2. "Cone Runs Uphill", defying the Law of Gravitation.
3. The Minister among the watchers of the exhibit, "Lissajous Figure".
4. Demonstration of the exhibit, "Harmograph."

28 YEARS OF SERVICE TO THE NATION, BIRLA INDUSTRIAL & TECHNOLOGICAL MUSEUM

BITM opened its door to the people on May 02, 1959. And since then the Museum continued in the role of trend-setter in various directions.



Mr. J. Sengupta, Chairman of Chloride India Ltd., and the Guest of Honour in the inauguration ceremony, conducting simple experiment in rocket propulsion. Onlooking is Mr. S.K. Bagchi, Director of the Museum.

Star attractions of the 28th anniversary were—(1) A micro-robot interfaced with a microcomputer that did things at the visitors' commands (2) A fascinating exhibition on Sir Issac Newton's "Principia", commemorating the tercentenary of the publication of this great treatise, and (3) A series of new participatory exhibits on aerodynamics, enriching the Transport Gallery. Another event—Science Quiz Contest for school children, was no mean attraction.



Robot in various manifestations. Accompanying graphics and blown-up photographs give the visitors an idea of the tremendous potentialities of Robots.

The Robot Show with demonstration has become a permanent feature of the Electronics & TV Gallery. People come thronging and manipulate the six nimble joints of the

robotic arm, namely Base, Shoulder, Elbow, Forearm, Wrist and Hand, at their own sweet will. Demonstrators elucidate the jargons like programming, interfacing and so on. Round the clock video shows on various industrial use of robot give the people glimpses into the Future. An animation film about a crazy robot exhilarates the children.



Young visitor with "Aerodynamics" exhibits.

The ingenuous exhibits on aerodynamics bring alive the saga of controlled flying, displaying the marvels of moving air, explaining Bernoulli's Principle. Shown is the effect of moving air on an aerofoil. Explained are the various related concepts like "lift" and "drag".



The exhibition on Newton's "Principia" had something for children and adults alike.

If we are to name three books that shook the world, they will perhaps be Newton's "Principia", Darwin's "Origin of Species" and Einstein's

Paper on the Theory of Relativity. The exhibition throws light on the publication of "Philosophiae Naturalis Principia Mathematica" in 1687 and depicts in an interesting way, Newton's letters to the Royal Society and to his friend Sir Edmund Halley, of the Comet fame.



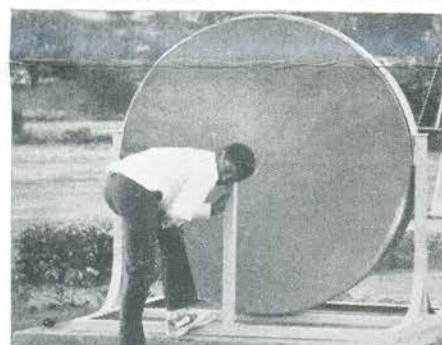
History re-created with manuscript and printed title pages of different editions of the "Principia". Potraits of personages associated with the book's publication enlivened the exhibition.

The exhibition revealed the story behind the publication of the book that is one of the landmarks of science, that acknowledgedly changed man's concept of the physical world. And the story is no less intriguing. Through these rare letters, the visitors come to know how a somewhat tight money position delayed Halley in printing of the book; how personal jealousy arose from Hooke and how Newton negotiated it; how the author toyed with the idea of changing the name of the treatise from "Philosophiae Naturalis Principia Mathematica" to "De Motu Corporum Libri Duo". "Philosophy is such an impertinently litigious lady . . .", wrote Newton, but upon second thought he retained the former title, "because it will help the sale of the book."

SCIENCE MUSEUMS IN INDIA

(Continued from page 1)

RAMAN SCIENCE CENTRE, NAGPUR



Planning for the main building of the Centre is also going on simultaneously. When complete, the building will contain among others, a gallery named "The Umbrella", that will focus on Earth's atmosphere and various related phenomena like its composition, reasons for cloud-formation, pollution and its prevention, why Earth's atmosphere is different from other planets, and so on. These are definitely worth a thought; they can evoke in one deep scientific questioning, they can lead one to the inner reaches of Nature's mysteries. Exhibits in the gallery will throw a new light on them.

The project, scheduled to be completed within a couple of years, will involve an expenditure of Rupees seven million, as per present day estimate.

Col. 1 (from top) :—

1. The Minister in interaction with exhibits on "Perception" inside the Museobus.
2. Youngsters at the "Lever" exhibit.
3. Having a chat in normal voice with a friend quite a distance away. "Whispering Garden", or the parabolic sound reflector exhibit provides the facility.
4. Rolling balls on "Minimum Time Path" interest the teachers too.
5. "Perspective Drawing" is great fun, no doubt.

Col. 2 :—

Dr. Saroj Ghose, Director General of NCSM, explaining the "Pulley Drive" exhibit to the dignitaries.

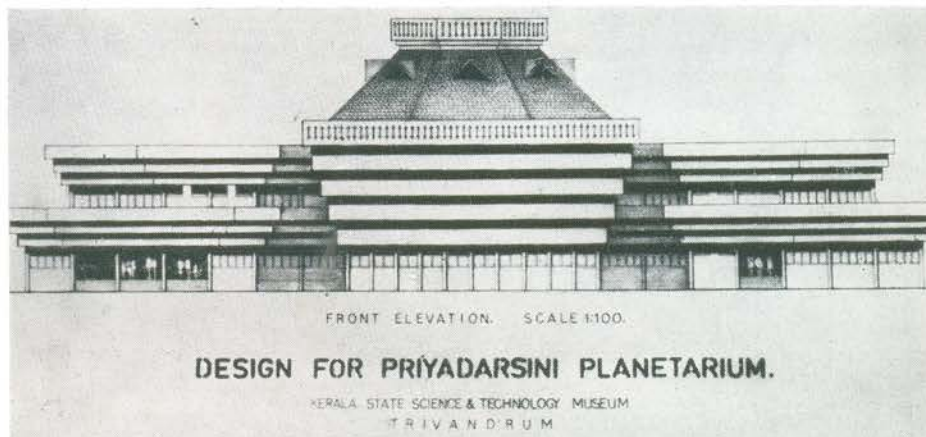
Col. 3 :—

"Archimedes's Screw" can draw such crowds of visitors.

Kerala State Science & Technology Museum, Trivandrum

Founded in 1984 by the Education Department of Kerala State Government, the Museum is located at the heart of the Capital city on an area of six acres, and thus enjoys the advantage of being within easy reach of the visitors.

sages setting up a dozen major galleries, covering almost all disciplines of science technology. A planetarium, an observatory, an auditorium, a Children's Science Park—all are in the offing. The idea is to transform the campus into a Techno-



Starting modestly with about 250 exhibits in 3 galleries viz. Electricity & Electronics, Mechanics and Mechanical Engineering, the project envi-

logy Garden. Outreach activities like travelling exhibitions and teachers' training programmes are also under planning.

Inauguration of the exhibition
"25 Years of Space Photography"
 Lalit Kala Akademi, New Delhi.
 July 04—August 02, 1987

Organised by : National Science
 Centre, Delhi.

Inauguration of the
 Science Technology Exhibition
 in **Festival of India—USSR**
 Leningrad, August 20, 1987

National Council of Science Museums
 and Deptt. of Science & Technology,
 Govt. of India

VIIIth Indo-US Workshop on
**"Appropriate Use of High
 Technology in Science Museums"**
 USA, September 1987

National Council of Science Museums
 and Indo-US Sub-Commission on
 Education & Culture.

West Bengal Students' Science
 Seminar on
**"Pollute and Perish ; Conserve
 and Flourish"**
 Calcutta, August 22, 1987

Birla Industrial & Technological
 Museum, Calcutta

ASTC Annual Conference on
"The Role of Enterprise"
 October 18-20, 1987

Host : Pacific Science Centre,
 Seattle, USA

ASTC Workshop on
**"Field Camps as a Science Centre
 Enterprise"**
 October 21-22, 1987

Co-sponsor : Oregon Museum of
 Science & Industry, Portland, USA

Vth International Conference on
Electrons (ISE-6)
 Delhi, December 7-9, 1988

Department of Physics, IIT, New Delhi

ENVIROTECH-88

Third International Exhibition and
 Conference on Pollution Control and
 Industrial Safety.
 Bombay, January 1988

CHEMTECH Secretariate, Bombay.

Xth International Conference on
Soil Zoology
 Bangalore, August 1988

Indian Society of Soil Biology &
 Ecology and Deptt. of Entomology,
 University of Agricultural Sciences,
 Bangalore.

AERODYNAMICS



The new set of exhibits in the
 Transport Gallery of BITM brings
 alive the science of aviation.

The exhibits start with showing
 the marvels of moving air, eluci-
 dating the Bernoulli's Principle,
 which explains how the pressure
 of a moving fluid changes with
 its speed of flow. Then is shown,
 in an interesting manner, the
 effect of moving air on an aero-
 foil. Various other phenomena
 related to flying, like "lift,
 drag" and other factors work-
 ing on an aeroplane-wing are
 also explained.

ROBOT AT WORK



Robot is the "in" thing today,
 for various applications—from
 assembly line welding to mining
 or underwater exploration. So
 nothing can be more proper than
 installation of a micro-robotic
 arm, interfaced with a micro-
 computer, as a permanent exhibit
 in the Electronics & TV Gallery
 of Birla Industrial & Technologi-
 cal Museum. This intelligent
 machine, with six joints, namely

Base, Shoulder, Elbow, Forearm,
 Wrist and Hand, can be com-
 manded by the visitor, to pick up
 objects of given size. This micro-
 robot can lift objects as heavy as
 1.5 Kg., and with suitable soft-
 ware development it will be able
 to perform a multitude of chores
 like assembling, disassembling,
 sorting and segregation of com-
 ponents, measurement and tes-
 ting, welding and painting.

India a Festival of Science



The exhibition, travelling all over the USA for more than two years, has now reached the Museum of Science in Boston, the ultimate site. Inaugurated on May 12, '87 the exhibition is scheduled to stay there for three months, before homecoming.

that in itself is no mean achievement. Further, it is earnestly believed that in future more and more such exchange programmes will ensue, and some kind of follow-up technique will evolve, in order to consolidate the mutual gains.



What is the achievement of the massive efforts that went behind conceptualising, fabricating and organising the exhibition of such great magnitude?

Nothing is outright tangible. But then no quick result is to be expected either. Over a million Americans came to know India, got a close look at India's multifaceted traditions; and

Col. 1 :—

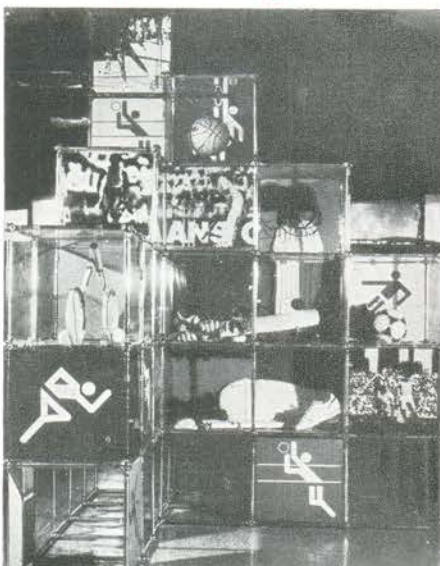
Bostonians moving amidst the towering exhibition.

Col. 2 and 3 :—

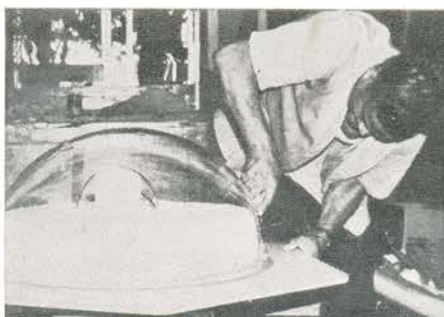
Live demonstrations by mastercraftsmen on "cire perdue" casting (lost wax process), and musical instruments.

NATIONAL COUNCIL OF SCIENCE MUSEUMS SENDS A FASCINATING SCIENCE TECHNOLOGY EXHIBITION TO USSR

a part of a large Science Exhibition organised by Department of Science & Technology, Govt. of India



*Above :—
Show case of "Made In India" sports goods.*



*Right :—
Artists at work, round the clock, for months together.*

(Continued in page 6)

Pollute and Perish, Conserve and Flourish

This is the topic of the National Science Seminar this year. After the successive stages of Block and District Level Seminars throughout the country, winner participants go through State Level Seminars, finally to meet at the National Level contest. West Bengal Students' Science Seminar '87 opens at BITM on August 22. The National Level Seminar is scheduled to take place in Delhi, during October.

Follow the Nature Trail

All the Science Museums and Centres all over the country celebrated the World Environment Day on June 5, 1987, with an assortment of interesting programmes, for children.

BITM observed the Day on June 06, 1987, with a unique programme, thus named. On the morning of June 06, children of Class VI to VIII from different schools of Calcutta were taken to the Horticultural Gardens, where they were given a fixed route to go along, looking for pugmarks of animals, birds, their nests, feathers and so on. Identification of trees was also a part of the programme. They were given a questionnaire to record their findings.

The Day was rounded off with a colourful and hilarious Costume Parade at the Museum by primary level school children. In this programme they enacted with proper sound and motion, animals, birds, trees and even flowers, fruits and vegetables! Many prizes were there, to enthuse the youngsters.

B.M. Birla Planetarium Hyderabad

A new Sky-Show entitled "SECRETS OF THE UNIVERSE" was inaugurated at the B.M. Birla Planetarium, Hyderabad, on 26th April, 1987. The Sky Show highlights the importance of the 1987 Supernova, which is one of the major astronomical events of the Century. This apart, the programme explores the strange worlds of Comets, Pulsars and Black Holes. Along with the Sky Show, was also inaugurated, for the first time in India, a multilanguage facility. Visitors can now enjoy the show in English or Telugu simultaneously.

Design and Construction of Outdoor Science Park—7th Indo-US Workshop.



Dr. Geoffrey Bonner (Centre), Director of Exhibits and Programmes, St. Louis Science Centre in Missouri, engaged in discussion with ace Indian experts. This was held during Dr. Bonner's visit to Calcutta in December, 1986.

Left :—

Mr. R M Chakraborti, Director of Nehru Science Centre, Bombay, speaking in the Workshop held in Missouri. NSC introduced Science Park in India, and it is the largest in the country.

Bilateral exchange of ideas and technology between the Science Museums in the USA and their counterparts in India is the aim; and the series of Workshops held every year in both the countries alternatively provide the platform. Though the exchange is in the field of science technology, it is not just a one way traffic.

Considering the positive impact of Outdoor Science Park on children's informal education, the Science Centres in the USA turned to India, and to NCSM to be precise, for the

know how. That was the theme of the Workshop held in Missouri and New York during April 27-29 this year. Discussions covered extensive topics like philosophy and concept of Outdoor Science Park, how to choose subject matter, mode of presentation, theories and effect on learning activities, design considerations, cost-effectiveness, visitors' service and so on. Borrowing from Indian expertise, Science Museums in the USA proposed to establish such Science Parks, starting with St. Louis Science Centre in Missouri and New York Hall of Science in Queens.

(Continued from page 5)

Festival of India in the USSR

NCSM is taking part in a big way in the forthcoming Festival of India in the USSR, organised by the Govt. of India. Conceptualisation and fabrication of exhibits, models and graphics being complete, a six thousand sq. ft. exhibition is now being packed for despatch. Scheduled to be inaugurated in the USSR on August, 20, '87 at Leningrad, the exhibition will travel through Moscow (November 19—December 18) and Tashkent (January 26 to February 25, 1988) before homecoming.

Like the 'Festival of Science' in the USA, a section of the exhibition depicts the development of science technology in India over five millenia. But the interesting addition is the section named "Challenges for Children", that offers to the children scope for funful exploration in various phenomena of science, through an assortment of hands-on exhibits.

In the media-conference on June 10, 1987, Dr. Saroj Ghose, Director General of NCSM explained elaborately the nature and scope of the exhibition, before an enthusiastic assemblage of people from Newspapers, Radio and Television. The exhibition got wide publicity in the Media.

"Life and Science" Opens at Taiwan Science Education Centre

In the words of Chiang Kai-Shek, "The purpose of life is to improve the livelihood of all human beings; the meaning of life is to create the succeeding lives of the universe." To commemorate the 100th anniversary of his birth, the National Taiwan Science Education Centre has created an exhibition called *Life and Science*.



Visitors to Taiwan's "Life and Science" exhibition can analyse the nutritional content of their diet.

The exhibition is composed of 35 exhibits on such subjects as the human body, ecology, the reproduction of animals, and the environment. In addition, visitors can see bees and chickens being raised.

The National Taiwan Science Education Centre spent three years and \$5,000 dollars in creating the exhibits.

"Hidden Light"—the Exploratorium Exhibition Opened in France

The unique exhibition, coming from Exploratorium in San Francisco, was inaugurated at the City of Science and Industry in France, on May 26, 1987.

On this occasion of the inauguration of the exhibition, Christian Mazet, plastic artist, demonstrated the marvels of light with sculptures.

Robot Exhibition Makes Debut at Museum of Science, Boston

"*Robots and Beyond: The Age of Intelligent Machines*", the latest Science Museum Exhibit Collaborative (SMEC) exhibition, provides a close-up look at the many applications of artificial intelligence today.

Developed by the Boston Museum of Science where it is making its debut, the exhibition is a \$4-million, five-year project with an advisory board of national leaders in the field of artificial intelligence and robotics to guide its progress. More than 40 contributions by two dozen corporations and institutions are included in the exhibition.

Museum visitors are introduced to artificial intelligence by watching a robotic artist create works of art, and listening to music improvised by a robot developed by The Kurzweil Foundation.



Wabot II—is featured in a video in "Robots and Beyond" exhibition.

In a section called "Robot Senses," visitors can interact with robots that can see, hear, talk, handle objects, and move around. Visitors can touch one robot in various ways to elicit verbal responses ranging from "ouch" to "it tickles". Another robot takes words selected by the audience, and attempts to make sentences out of them, often with amusing results.

"Visions of the Future" features a videotape of a keyboard-playing robot exhibited at the 1985 Expo in Japan; unusual mechanisms for making robots walk; a new educational robot called Hero 2000; celebrity robot No. 5, star of the movie, *Short Circuit* and science-fiction film clips.

The Danilov Years

Dr. Victor J. Danilov retired on April 01, 1987 from the presidency of the Museum of Science and Industry in Chicago, leaving quite a legacy. During his 15-year tenure, the Museum has improved and expanded exhibit offerings, education programmes, community services, and facilities. Among the innovations are an exhibit to honour America's Nobel laureates in the sciences; a preschool science exhibit; a science library for children and science teachers; special programmes for minorities, the elderly, and the disabled; and major special exhibitions.



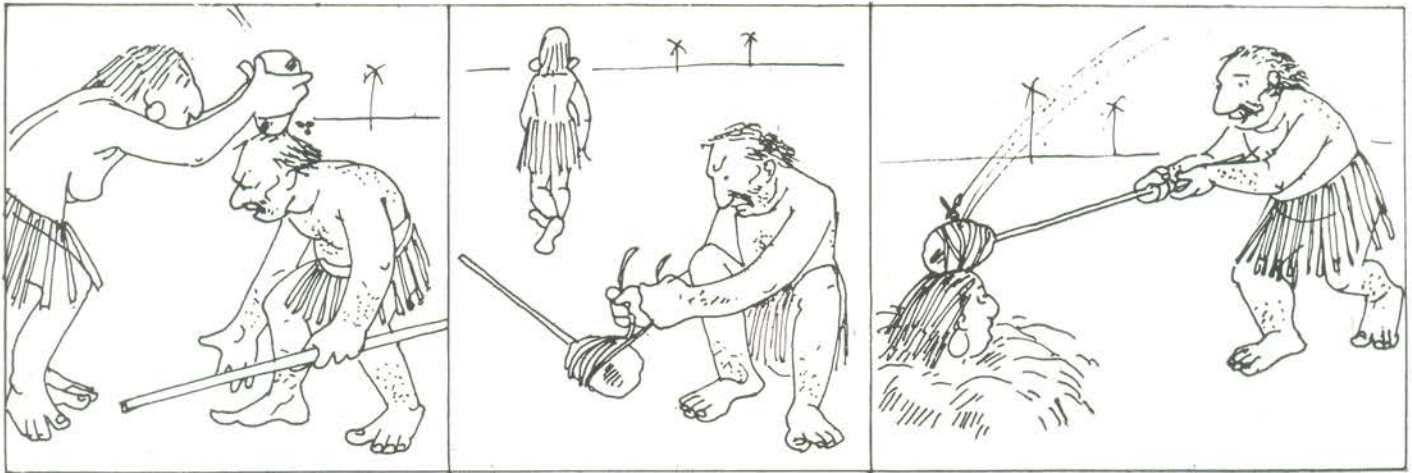
Dr. Victor J. Danilov with his wife, Tony.

Throughout his Museum career, Dr. Danilov has been a leader in furthering informal science education through museums and in initiating collaborative efforts throughout the world.

He visited India on two occasions:— UNESCO Workshop on "Establishment of Science Museums in Asian Countries: Training and Exchange", held in Bangalore in 1980 and CIMUSET's annual meeting in 1982.

Dr. Danilov is a great friend of the Science Museums in India. He also took great interest in hosting the NCSM's exhibition, "India—a Festival of Science" in the USA, and it was his Museum where the exhibition was first inaugurated on June 06, 1985. Dr. Danilov is the author of a great many books on Science Museum which are valuable references for Science Museum people all over the World.

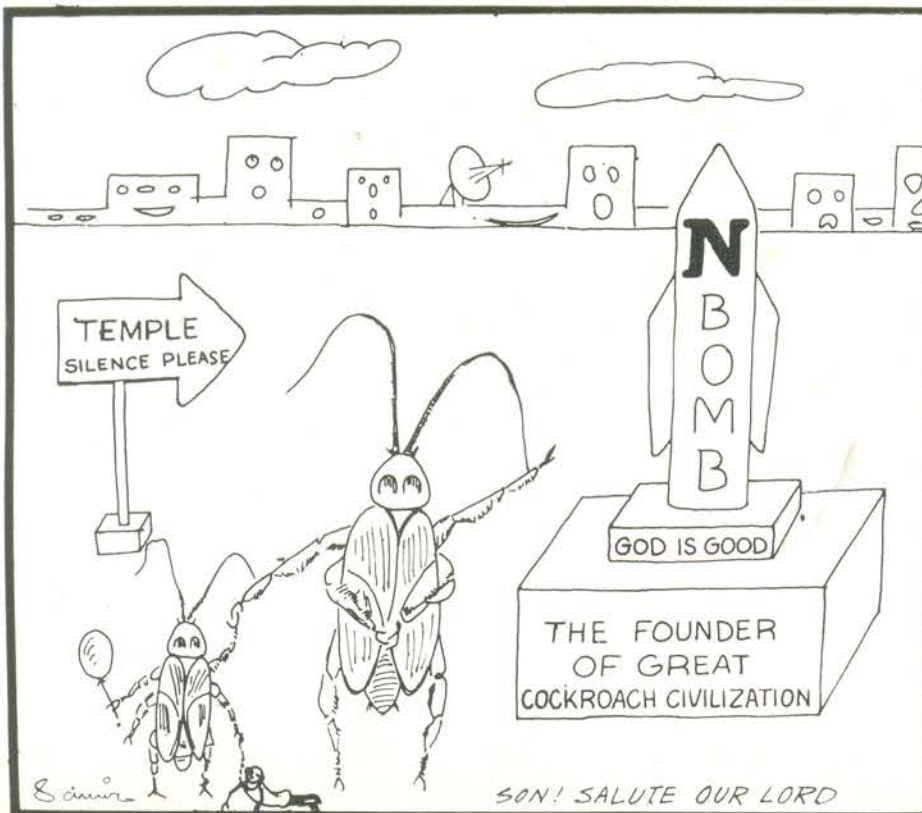
UTILITY OF LEVER ILLUSTRATED



To Those With An Eye For Incongruity :—

CAPSULE thankfully acknowledges the first ever contribution made by Dr. Samir Banerjee, one of its readers. Thank you, Dr. Banerjee, for this "cockroach" cartoon. Your vision of the 'future' is indeed 'wild'. We believe, this is just the beginning.

Capsule looks forward to more such pleasant participation from a great many readers. Accepted ones shall be eligible for incentives.



THE NEXT...

The Science Technology Exhibition sent by DST to the Festival of India in the USSR will be inaugurated at Leningrad on August 20, 1987. The Exhibition, with 16000 sq. ft. area and preaching the message of India, will travel through Moscow and Tashkent, over a period of six months.

Capsule-7 will give you the details.

WE NEED....

EDITOR CAPSULE is looking forward to your sending by July 31, 1987 publication materials for the Seventh issue of CAPSULE. Please send short notes, photographs, problems, suggestions, cartoons and puzzles.



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