

A MEET OF BUDDING SCIENTISTS

JAN-MAR / 1988

Capsule 8

NATIONAL SCIENCE SEMINAR—1987

Thirtyone students, representing all the States and Union Territories of India, assembled at the FICCI Auditorium in New Delhi on September 24, 1987, for the final round of the Seminar. A major annual event of NCSM, organised in collaboration with the State Education Departments, this Seminar has a kind of multi-tier, pyramid-like system: on a given theme or topic of national relevance, thousands of students all over India start interacting at Block level, and gradually go up to the National level, through the successive stages of District and State level contests.

(Contd. in Page 8)

If you are a school student, join National Science Seminar '87 on

**POLLUTE
AND PERISH
CONSERVE
AND FLOURISH**

AND WIN FABULOUS PRIZES AND SCHOLARSHIPS



NATIONAL COUNCIL OF SCIENCE MUSEUMS
FOR DETAIL CONTACT: EDUCATION DIRECTORATE ON S.C.E.R.T. IN YOUR STATE

NCSM SPEAKS

"Thank you for forwarding to us several copies of CAPSULE which featured three articles on work in which the Sub-Commission was involved. We have, in turn, sent on a copy to individuals also involved in those programs mentioned, who we felt would be very interested to read of accounts of their work."

CAPSULE continues to be a fine publication, reporting on the very important work of the National Council of Science Museums and on developments in the field of Science Museums in India and around the world. Thank you again for continuing to keep us posted."

Mr. Ted M G Tanen, American Executive Director of the Indo-US Sub-Commission on Education & Culture wrote to us, on receipt of the previous issue of CAPSULE.

Thank you Mr. Tanen, for such appreciations.

It is a standing request to our readers to write to us about their reactions to CAPSULE, so that we can use the feedback in improving the quality of this Newsletter.

*A happy New Year
to all our readers
and well-wishers*



(Top) The simple but evocative logo of the Seminar.

(Above) Participants in a group, with dignitaries.

(Left) Ms. Sudipta Banerjee from West Bengal (inset) receiving the first prize from Dr. Raja Ramanna, Ex-Chairman of the Atomic Energy Commission.

Science Museum Movement in India dates three decades back. Within this span of time it has gone through a metamorphic process, reshaping itself both in body and spirit. On the one hand, science museums ceased to be mere store-houses of artefacts, and put a major thrust in making interactive exhibits. On the other hand, they took up extensive educational programmes for people of all age-groups, especially school-children.

Science Demonstration Lecture (SDL), Creative Abilities Centre (CAC) and Teachers' Training Programme (TTP) are the major science museums programmes that aim at supplementing science education in schools. Interrelated as they are, these programmes are meticulously devised so as to supplement one another, and spearhead the science consciousness movement across the country.

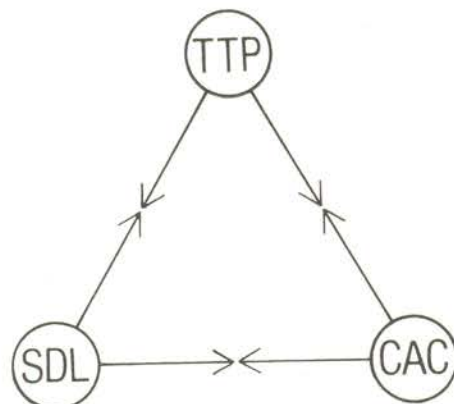
SCIENCE DEMONSTRATION LECTURE

SDL is conducted in urban and rural schools by experienced staff of the science museums. Lectures are delivered with the help of a series of teaching kits, on subjects chosen from school syllabi. Such kits are simple, inexpensive and require no special skill in designing; and coupled with an appropriate form of presentation, they bring text book science alive.

CREATIVE ABILITIES CENTRE

Children of rural and urban schools are encouraged to participate in

science Museum FOR EDUCATION



this programme. They are given a free hand to work with tools and materials. They are at liberty to take any specific project related to their science-hobbies and work on it, or to go for just casual investigation. Giving fullest expression to their imagination, they often come with novel, innovative things. In fact, CAC programme is the seed-bed of the thousands of young innovators across the country who take part in the annual Science Fairs and Camps, another major Science Museum programme.

TEACHERS' TRAINING PROGRAMME

This is to train school teachers for running Science Demonstration Lectures and Creative Abilities Centres in their schools. The introductory course acquaints teachers with common tools and techniques of fabricating simple teaching kits and equipments with their help.

The advanced course aims at developing creative faculties in the teachers, in evolving new concepts on kits. Both the courses are of two weeks' duration. In the course of the training, teachers are also given an idea of how to make a fitting presentation, to match their demonstration kits.

TTP, SDL and CAC—they all fall into the category of an integrated educational programme launched by NCSM. Very much interdependent as they are, they cannot function meaningfully and positively without feedback from the other two.



(Top) Science Demonstration Lecture in Calcutta. (Above left) Teachers' Training Programme in Bombay. (Above right) Creative Abilities Centre in Bangalore. All the Science Museums and Centres under NCSM conduct such programmes regularly.

25 YEARS OF SPACE PHOTOGRAPHY

REMAINS IN INDIA

This rare exhibition of 150 planetary photographs that came from the USA to India during November last year, is now remaining here, permanently. On 20 October, 1987 the exhibition was inaugurated at Shrikrishna Science Centre in Patna, after the round-the-year shows at NCSM units in Calcutta, Tirunelveli, Bangalore, Bombay, Delhi and Bhubaneswar. Everywhere people's response was overwhelming: half a million people came to see it. It was felt that the exhibition needs to be held in many other places as well; and the American authorities handed the exhibition over to NCSM, for planning and co-ordinating further shows.

The tentative schedule of the exhibition upto February 1989 covers the following institutions and places, all over India—

B M Birla Planetarium, Hyderabad
Tamil Nadu Science and Technology Centres, Madras
District Science Centre, Gulbarga
Madhya Pradesh Council of Science & Technology, Bhopal
Birla Institute of Scientific Research, Jaipur
Department of Science & Technology, Govt. of Rajasthan, (at Jodhpur and Kota)
District Science Centre, Dharampur
Baroda Museum, Baroda
Regional Science Centre, Lucknow
Jawahar Planetarium, Allahabad
Raman Science Centre, Nagpur
District Science Centre, Purulia
Regional Science Centre, Guwahati

On 24 October, 1987 Smt. Krishna Shahi, Union Minister of State for Education and Culture, formally received the exhibition from the representatives of Jet Propulsion Laboratory, and Baxter Art Gallery in California, and IBM Corporation. The Minister in her speech spoke about the extreme importance of Space-research, and stressed on the attainment of a universal fraternity through it. She thanked Mr.



Smt. Krishna Shahi formally receiving the exhibition. (Inset) the exhibition's debut in 1986. Mr. Jay Belloli presenting to Dr. Saroj Ghose a photograph of Uranus in real and false colour.

Jurie van der Woude of JPL, Mr. Jay Belloli of Baxter Art Gallery and Mr. P Shanker of IBM in Delhi, for coming to Patna.

Mr. Jurie van der Woude, speaking on the occasion, expressed his immense spiritual satisfaction that he got in coming to India and working with Indian scientists. "The Space Photography exhibition is a living one, and new photographs will be continually added, as more information comes from Space", he said. JPL will provide NCSM with photographs that will be received from Neptune in 1989, sent by Spacecraft Voyager-II.

Dr. Saroj Ghose, Director General of NCSM, narrated the background of the exchange programme between JPL and NCSM, and emphasized the role of Indo-US Sub-Commission on Education and Culture. He said that more such co-operative programmes will ensure in future.

MARS IS HIS PASSION. . . .

"Putting Life on Mars—Manned Mars Mission" was the fascinating topic on which JPL's scientist Mr. Stephen Wall spoke on 5 October, 1987 at Shrikrishna Science Centre, Patna. The lecture was arranged as a part of Dr. Shri-

krishna Singh Centenary celebration programme.

"The biggest challenge for us is to find out facts about this lovely planet", said Mr. Wall. He is convinced that it is possible to have a colony of homo sapiens up there, although just placing someone successfully on Mars may take as much as a century. Not much is known about the planet, he said, except the fact that Mars shares with Earth several similarities like minerals and period of rotation. But among dissimilarities, are the absence of oxygen, severe dust storm, less heat, great atmospheric pressure and low gravitational pull.

Dr. Wall's lecture tour in India covered six NCSM Units, at Delhi, Patna, Calcutta, Bhubaneswar, Bangalore and Bombay. Another topic of his lecture was "Exploring Venus with Radar Eye—Magellan Project." This is the project which he is presently involved with, at JPL, as the Experiment Representative. Magellan is NASA's next planetary probe scheduled for 1990, and will use a Synthetic Aperture Radar (SAR) camera to map the surface of Venus. Mr. Wall is charged with representing the science interest of the onboard experiments. He also currently conducts research on multiple-angle SAR backscatter and calibration.

"ENVIROTECH-88"

3rd International Exhibition & Conference on
Industrial Pollution Control & Safety
Nehru Centre, Bombay,
20-25 January, 1988.
Environmental Management
Centre of
CHEMTECH Foundation, Bombay.

Inauguration of the travelling
Science-Technology Exhibition
in the Festival of India in USSR
Tashkent, 26 January, 1988.
National Council of Science
Museums, assisting Deptt. of
Science & Technology,
Govt. of India.

Inauguration of the
Eastern India Science Camp
Patna, 13-17 February, 1988.
Birla Industrial & Technological
Museum, Calcutta, in collaboration
with State Departments of Education
and Youth Services.

Inauguration of the
Southern India Science Fair
Bangalore, 17-12 January, 1988.
Visvesvaraya Industrial &
Technological
Museum, Bangalore,
in collaboration with
State Departments of Education
and Youth Services.

Symposium on
*Utilisation of Renewable
Sources of Energy*
Allahabad, 4-13 January, 1988.
Institute of Engineering &
Rural Technology,
Allahabad.

Symposium on
Human Resource Development
Ahmedabad, 22-27 February, 1988.
Indian Institute of Management,
Ahmedabad.

International Conference on
*Tropical Micro-Meteorology
and Air Pollution*
New Delhi, 15-19 February, 1988.
Centre for Atmospheric Sciences
Indian Institute of Technology,
New Delhi.

Museum Assessment Program
1225 Eye St. NW, Washington DC.
29 January, 1988
(Application Deadline)
Institute of Museum Services and
American Association of Museums,
USA.

UNIQUE PATH

This exhibit has been named as
Unique Path and it explains a
property of cycloid (a mathematical
curve) namely, "Tautochrone
Property."

Two cycloid paths of same dimension
are provided, alongwith a
pair of parabolic paths of same
dimension. Bells are hung exactly
at the bottom-most points of the
curve.

Experiment shows that

(1) a pair of balls when released
from same height in the cycloid
paths, hit the bells together at the
same time.

(2) the same result is observed
when the balls are released from
the same height in the parabolic
paths. They hit the bells at the
same time, as only one sound is
heard.

(3) the same pair of balls, when
released from different heights in
the parabolic paths, hit the bells at
different times, which is indicated
by two distinctly different strokes.



Now, a rather intriguing thing
happens when the pair of balls are
released from two different heights
in the cycloid paths. They again hit
the bells at the same time.

Why ?

This is due to "Tautochrone Property", which states :

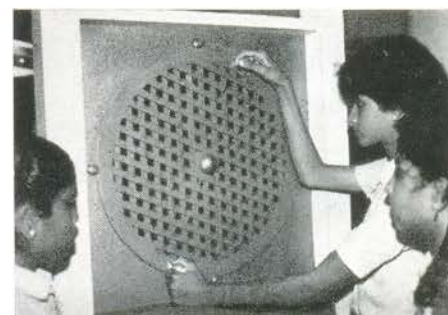
The time required for a particle to
move down the curve of a cycloid
path to the lowest point is independent
of the starting position.

SIEVE OF LIGHT

This exhibit has been named as
Sieve of Light, and it gives the
analogy of the action of a polaroid
sheet.

The whole of the gallery is viewed
through two sets of slits which are
matched exactly. It is observed
that viewing is quite easy. Now,
one of the slits is given a turn, to
make the slits cross each other.
When the gallery is viewed through
the crossed slits, it is observed
that visibility gets considerably
poor, effecting a strained viewing.

This exhibit gives an idea—how
light, having vibration in all directions,
can pass through two polaroid
sheets having stretched slits
like molecules, but gets cut off



when one of the sheets is given a
turn.

These two exhibits are new additions
to the Popular Science
Gallery of District Science Centre,
Gulbarga.

Festival of Science

IN THE USSR

On the second of a three-leg USSR tour, the exhibition is now in Moscow. During the month of its stay at Leningrad (20 August—18 September, 1987) the exhibition gained a great popularity.

As a part of the countrywide *Festival of India* celebration, this exhibition of 2500 sq. mt. area was sent by the Department of Science & Technology, Govt. of India. On assignment from DST, NCSM conceptualized and fabricated a 600 sq. mt. part of the exhibition, presenting the panorama of ancient Indian science and technology, mostly in the form of three-dimensional and interactive exhibits. The participatory nature of the exhibits in the section entitled "*Challenges for Children*" proves to be a sure catch for young people everywhere.

IN THE USA

The 1500 sq. mt. travelling exhibition funded by the Department of Science & Technology and conceptualised, fabricated and organised by NCSM, appeared in six American cities during 1985-1987, as part of the *Festival of India* celebration. The presentation surveys India's influence in the areas of science, technology, and the arts, as it highlights contributions to mathematics, astronomy, medicine, transportation, agriculture, music and crafts. In addition to depicting the variety and richness of India's traditions, the exhibition shows how the country has played a far-reaching role in the advancement of scientific knowledge and applied her technological know-how to the many needs of a developing nation.

ASTC (Association of Science-Technology Centers, USA) feels that more and more people need to see it. That is why retaining it, they have chosen a reduced version of 250 sq. mt. area, in order

Inaugurated on 19 November, 1987 the exhibition will remain at Moscow upto 18 December, 1987,

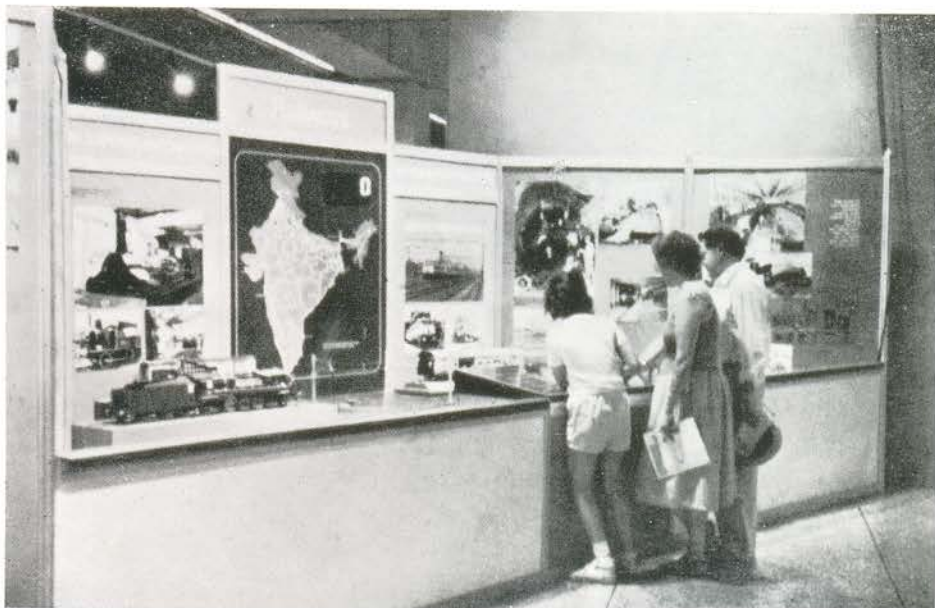
before opening at Tashkent, the ultimate site, on 26 January, 1988, and then it will return to India.



"Bernoulli's Principle" in action. Many such exhibits are there, to fascinate the youngsters.

to accommodate the needs of smaller museums. This new form, comprising about fifty panels with models and reproductions, con-

temporary crafts and musical instruments, participatory devices and games, explores mathematical concepts and Indian agriculture.



A view of the Festival of Science in the USA.

PERCEPTION



Working exhibits clarify many a concept.

Nehru Science Centre, Bombay celebrated its 2nd anniversary on 11 November, 1987 with the inauguration of the new Mobile Science Exhibition unit, "Perception." Twentyfour exhibits, all hands-on and uniform in size, are mounted in a specially designed bus that will now onward travel across the western region of India, giving people an insight into various aspects of perception.

Here much attention has been given to the processes relating to vision, because vision provides us with maximum information about our surroundings. The phenomenon of optical illusion is also explained. Processes relating to other sense-organs like ear, skin and nose are also exemplified.

PORTABLE PLANETARIUM

The most important spin-off of the VIth Indo-US Workshop on *New Approaches to Planetarium Education* held at the NCSM Headquarters during 9-13 March, 1987 is the introduction of inflatable planetarium programme in India. The Workshop's most interesting feature was the presentation of inflatable planetarium programme before school groups; and students' keen participation revealed the high potential of it, and also underscored various considerations in the context of its use in the rural Indian situation. Based on the experience, NCSM has indigenously fabricated 25 copies of the planetarium, in technical collaboration with Learning Technologies Inc. of the USA. A manual has also been developed. These planetaria will now onward travel across rural India, disseminating planetarium-education at grassroot level.

On 15 December, 1987 the first of these planetaria was inaugurated at the District Science Centre in Purulia, on the occasion of its 5th anniversary.

Another one goes to Vikram A Sarabhai Community Science Centre in Ahmedabad.

SCIENCE CENTRE NEWS...

District Science Centre, Gulbarga organised a Workshop on *Mathematics Teaching in Pre-School and Primary levels*, on 7 September, 1987. 35 primary school teachers attended the Workshop and developed low-cost teaching aids suitable for teaching lower level arithmetic.

District Science Centre, Tirunelveli conducted *Environment Awareness Programme* on 31 October, 1987. Nehru Yuva Kendra collaborated in this programme. 56 villagers took part in this programme where lectures and discussions centred largely around awareness-drive on draught relief.

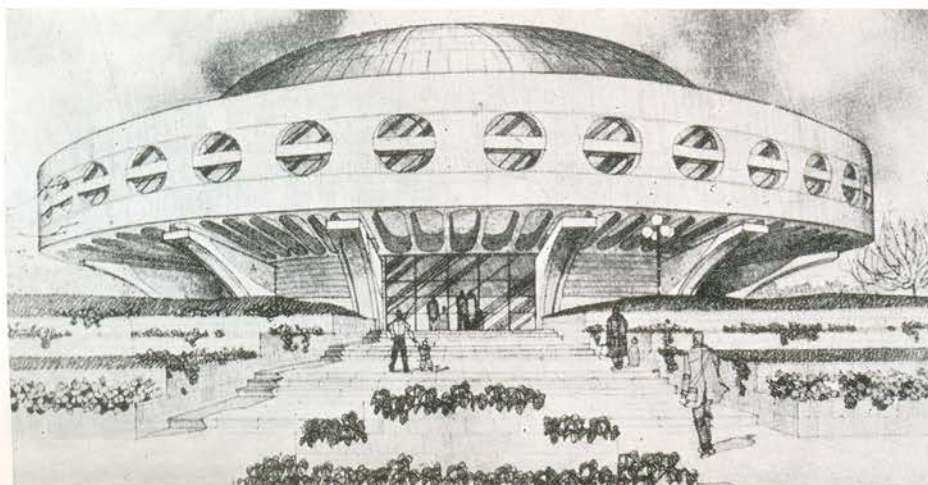
During November, 1987 the Centre conducted a *Hobby Programme on Electronics*, for about 50 school students. This programme was preceded by an *Astronomy Awareness Programme*, for school students.

District Science Centre, Tirunelveli organised a *Bakery Demonstration Workshop*, in collaboration with U.S. Wheat Associates, New Delhi, The Society of Indian Bakers, and the Association of Food Scientists & Technologists (India). Many valuable ideas were generated in the four-day-long interaction. On this occasion a book was also released, rich in many thought-provoking articles by eminent specialists of both India and the USA.

PATHANI SAMANTA PLANETARIUM, BHUBANESWAR

Opposite to the Regional Science Centre and adjacent to the Regional Research Laboratory, is coming up this magnificent looking Planetarium by the Department of Science, Technology and Environ-

ment, Govt. of Orissa. Foundation of this 150 seat Planetarium with a 12 metre Dome was laid in October 1986. When complete, this planetarium is sure to be a great attraction in the capital city.



EXCHANGE OF SCIENCE MUSEUM PERSONNEL

Under the Exchange of Science Museum Personnel Programme, Mr. Wall's lecture-tour in India was preceded by those of four JPL Scientists—Dr. Stuart A Collins, Dr. R Stephen Saunders, Dr. Ellis Miner and Dr. William McLaughlin.

Mr. Claude Taieb, Scientific Director of the Palais De La Decouvert in Paris had also visited NCSM units at Delhi, Calcutta, Purulia, Bhubaneswar, Bombay and Bangalore, during 15 November—11 December 1987.

Dr. Bernard S Finn, Curator, Division of Electricity, Smithsonian Institution in Washington DC, is likely to visit India during 21 January—10 February, 1988.

OMNIMAX IN SINGAPORE

On the occasion of its 10th anniversary, Singapore Science Centre opened the new Omni-Theatre for the people of Singapore. Mr. Wee Kim Wee, the President of the Republic of Singapore, inaugurated the Theatre on 10 December, 1987. Preview of "Oasis in Space", a Planetarium show and two Omnimax shows titled "Time Concerto" and "To Fly" were arranged for the guests at the opening ceremony.

With this addition, Singapore Science Centre gets the distinction of being the first Science Centre in South East Asia to have a domed 70 mm Theatre.

CIMUSET ANNUAL MEETING IN BANGKOK

The meet of the *ICOM International Committee of Science and Technology Museums* was held at the Centre for Educational Museums in Bangkok during 1-5 December, 1987. It was attended by members from Thailand, USA, Sweden, UK, Denmark, Norway, USSR, Bulgaria, Spain, Federal Republic of Germany and India. Mr. S. K. Bagchi, Director of Birla Industrial & Technological Museum in Calcutta and Dr. Saroj Ghose, Director General of the National Council of Science Museums participated from India.



Brainstorming session of the meet.

Dr. Neil Cossons, Director of Science Museums London, delivered the keynote address on the theme "Museum as Medium". He emphasized the need for interactive presentation in science museums to make science and

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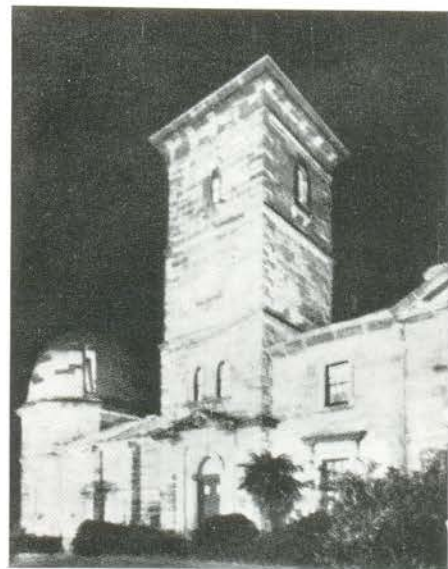
SYDNEY OBSERVATORY BECOMES HANDS-ON ASTRONOMY MUSEUM

Sydney Observatory, one of the oldest observatories in Australia, will be converted into Australia's first museum of astronomy.

Built in 1858 to provide a time service for ships in harbour and the early settlers of Sydney, it was closed down as a scientific institution in 1982 due to interfering city lights. It was then placed under the control of the Museum of Applied Arts and Sciences, and is now one of four branches of the Museum.

Permanent exhibition called "Windows into Space" will trace the historical development of astronomy in Australia from Captain Cook's epic voyage to the South Seas to contemporary developments. The theme will be illustrated by historical objects and inter-

active exhibits, to explain the principles and applications of astronomy.



The observatory will offer participatory astronomy exhibits in a 19th century ambience.

CANADA CAPTIVATED BY "ALIEN" CONTEST

A striped maggot, slimy beige worm, and cactus-shaped plant might not survive life on Earth, but two high school students in Nova Scotia believe the three-part ecosystem could easily endure a 12,000 year summer on Mars.

The inventors, Jean-Claude Naugler and Rose Smith, won top

honours in the intermediate division of a contest run by the National Science and Technology Museum in Ottawa. Now in its third year, the "Invent an Alien" contest has become a great success in Canada, attracting 10,000 entries this year. The event also generated plenty of media coverage in Canadian newspapers and on Cable Network News.



Winners of the "most artistic creation" prize, in the contest.

CIMUSET MEETING

(Contd. from page 7)

technology more comprehensible to common man. Discussions centered around three themes :

- * Historical Discoveries Within the Framework of Science Centres
- * Participatory Exhibits
- * Out-of-school Scientific Activity

Discussions were illustrated by video and slide presentations on the state-of-the-art of the science museums in the respective countries.

The next CIMUSET meetings shall be held in Budapest during July 1988, in India during December 1988 and in Charlotte, USA during the spring 1989. All these meetings shall be open to all members of CIMUSET.

NATIONAL SCIENCE SEMINAR

(Contd. from page 1)

Providing such a platform every year is just one of the NCSM's multi-prong services to the students' community of the country. As an institution devoted to the spread of non-formal education,

NCSM's such programmes endeavour to develop resourcefulness in them ; and all that is expected is that they will take their turn to disseminate the benefits in every walk of life.

Pollute and Perish : Conserve and Flourish that was the topic for 1987, given to school students to deliberate on. Axiomatic, and almost ringing a prophetic note, it got thousands of young thinkers all over the country into involved, intimate, and nevertheless critical discussions. It is always interesting to observe them—so young, yet so reflective. It was heartening to see them seriously share a common concern over this issue of global importance.

Ms. Sudipta Banerjee of Calcutta came out as the topper in the National Science Seminar, and received the NCSM Fellowship of Rs. 200.00 per month, tenable for one year. Next nine participants in order of merit got Fellowships of Rs. 100.00, for the same duration. Prizes in books were there, for all participants.

Among the distinguished people present in the National Seminar were—Dr. S Varadarajan, Chief

Consultant of the Planning Commission ; Dr. Raja Ramanna, Ex-Chairman of the Atomic Energy Commission ; Mr. K C Sivaramakrishnan, Project Director of the Central Ganga Authority and Shri Sundarlal Bahuguna, the eminent environmentalist of India.

THE NEXT...

Southern India Science Fair will be held at Bangalore during 17—21 January, 1988.

Eastern India Science Camp will be held at Patna during 13—17 February, 1988,

Rising through State level Competitions, thousands of students and science-buffs assemble in these annual events, to mark their creative abilities.

Exposure-oriented training camps on various sciences are also held there, for many observers coming from various States.

CAPSULE—9 will give you the details.

WE NEED...

EDITOR CAPSULE is looking forward to your sending by January 31, 1988, publication materials for the Ninth Issue of CAPSULE. Please send short notes, photographs, problems, suggestions, cartoons and puzzles.



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