



# DREAM 2047

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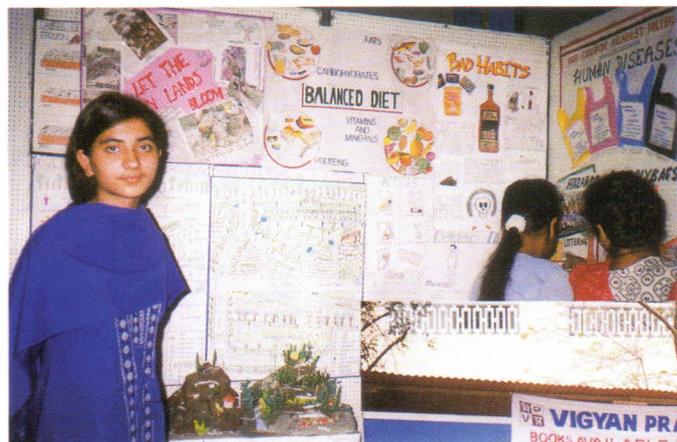
No. 4

## VP News

### Vigyan Prasar at NCSC - 98

The sixth National Children's Science Congress (NCSC) was held in the picturesque Anna University Campus, Chennai, during 27-31 December 1998. Transcending all barriers of language, religion, and caste, some 500 children from 26 states and union territories of India lived like a family in the campus for one week; actively pursuing all activities meant for them: the technical sessions, activity corners, exhibition, teachers' forum, face-to-face with scientists, sightseeing, and more. Vigyan Prasar

publications, as in the earlier years, attracted a large number of children and adults throughout the NCSC. VIPNET, the new addition to VP this year, was a very special attraction during the Children's Science Congress. Brisk activities, discussions in small and big groups, filling up of application forms and answering diverse queries kept Shri A.K. Misra (Coordinator VIPNET) and Dr. Narender K. Sehgal (Director, VP) quite busy in Chennai. A large number of science clubs is expected to join VIPNET very soon as a result of these interactions.



Project display at NCSC - 98



Vigyan Prasar stall at NCSC - 98

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### VP to Collaborate with Akashvani and Doordarshan Kendra of Chennai

Akashvani Chennai is likely to join the list of AIR stations in the country which are producing popular science serials with VP. In a meeting held in the Kendra on 28 December 1998 between Director VP and Shri B.R. Kumar, Station Director of Akashvani Chennai,

it was decided to hold a meeting-cum-workshop sometime in February-March 1999 to work out details of productions in Tamil to be broadcast all across the state. Dr. Sehgal was accompanied by Shri A.K. Misra, Fellow VP, and Dr. R. Sreedher, Director EMPC of IGNOU.

The same team also had a meeting with Shri N.G. Srinivasa, Director of DDK Chennai and discussed the possibilities of joint productions. The officials representing DDK (C) assured VP of its cooperation in such joint ventures. A clear picture on this collaboration would emerge after a meeting-cum-workshop around February-March 1999.

... think scientifically, act scientifically ... think scientifically, act scientifically ... think scientifically, act ...

**Indians: at home and abroad**

Most Indians who have made other countries as their homes have acquitted themselves very creditably. Over the years, the general impression they have created in the minds of people in their host countries therefore has been very positive. It could be described thus, in gross general terms:

Indians are of above-average intelligence, very hard working and sincere. If need be, they are willing to work after office hours. Also for the most part, they are peaceful and law-abiding citizens.

What about Indians in India? They can be divided into two broad categories: those working for the state/central governments and semi-government or public-sector organisations, and all the others. Those in the latter category, except for the "law-abiding" part, would also be describable more or less in terms similar to those used above for describing Indians working and living in foreign countries. But it is Indians in the former category i.e. government and semi-government employees who interest us most here. Their numbers are quite large, as the "government" (at the Centre and in the States) is the largest source of employment in the country. Incidentally, in this category, we also include all those Indians

who work in Indian embassies and consulates abroad.

What impression(s) Indians in this category have created in the minds of people -- both their own countrymen as well as foreigners - - who come in contact with them, or have to deal with them for one reason or another ? On a gross level, this impression can be itemised in the following terms: work (for which they draw salaries) is probably the last thing on their minds; they are very punctual (and perhaps even before time) as far as closing office hours, starting times of their tea/coffee and lunch breaks are concerned and almost never so or very particular about office opening hours and closing times of various breaks; while never too keen to give off their best on the job, or on diligently and sincerely carrying out their duties and fulfilling their responsibilities, but actively aware of and jealously guard and fight for every single reward, benefit, entitlement or right that should or could accrue to them irrespective of any attached conditionalities dependent on their duties/responsibilities and the quality or nature of their performance; they would frequently tell you all the things that did not form part of their work; and more. Gives a pretty good idea of the work ethic and work-culture of a great majority of those

in this category. It must, however, also be mentioned that there are exceptions, comprising a small minority, of people in the same category (everywhere and in every organisation) who defy the foregoing description.

How does one explain this? Same Indians doing things and behaving so differently, merely because they are employed by a State or Central or by a government organisation ! The inescapable conclusion is that the "differences" abovementioned can only be attributed to the government system -- meaning its rules and regulations, its treatment of its employees, the quality of leadership at various levels, the work environment it provides, the discipline it is able to maintain, the demands (in terms of work and performance) it makes on its employees, lack of accountability and so on.

Unless something can be done to remedy this situation, a major chunk of our resources (including revenue collected from taxes from the public) would keep going down the drain -- and there is no way that India of our dreams could come about thus ! Are we going to accept that ? No way ! Let's hear from our readers.

NKS

*Vigyan Prasar: An Insight***Technology to the aid of science popularisation**

The all too familiar television set acting as a window to the Internet and the world wide web? Something to look forward to! As a consequence of global networking via the Internet and the underlying concept of the WWW, finding ever-new ways of accessing information has become inevitable. But here is the catch. Surveys indicate that unlike TV receivers, computers are yet to gain entry into most households. Hence the Internet does not reach many. On the contrary,

television occupies a place of pride in many a home and is even found at workplaces and schools. Developing a technology capable of porting information into the television could thus be a boon for many, especially children, whose thirst for information is generally insatiable.

A group of computer professionals at Innomedia, Bangalore, has been working on the technology of integrating the Cable TV network with a unique server -- the Cable TV based

Home and Office Interactive Service (CHOIS) server--to provide information on demand.

Being aware of the utility of such a technology, Vigyan Prasar, along with TIFAC (the Technology Information, Forecasting and Assessment Council ) DST, Delhi have joined hands for a project aimed at spreading S&T awareness among school and college students through use of the CHOIS technology.

In the background is a telecomputer, the CHOIS Server and a CHOIS pad, employing which, users can request and view information that is available on the server by exploiting the existing infrastructure, i.e. the television receiver and the cable connection(s).

The telecomputer will have a repository of information. Such telecomputers are linked satellites for information exchange. On a larger scale, telecomputers can be placed in all major cities and linked. They also perform other tasks like maintaining user statistics, updating the servers connected to them, and in general, as Internet service provider(s).

A CHOIS server is installed at the cable head-end. This can be linked to the telecomputer via leased/dial up lines for data transfer on one side and, on the other, with a CHOIS pad through both analog and digital channels. The CHOIS pad is actually a set-top device which interfaces the TV receiver with the CHOIS server. This provides a two way link to the cable service provider at the cable head-end. The user, with the help of a pointing device (which as well may be cell phone) can select channels and programmes for viewing by clicking on icons. In addition, it allows control of the attached TV, VCR or phone. Together, this technology can be used with advantage for porting content to specific groups. The interactivity achievable can be truly satisfying.

The technological advance in using the large bandwidth of the Cable TV Network to carry users' requests to the server on the reverse path (user to server) has made it possible to have interactive multiple access to the CHOIS Channel. Alternately, use of the telephone line for the reverse path is also a functional module, but then the number of users accessing concurrently gets limited by the number of client servers and the number of telephone lines.

CHOIServer is a pentium processor based high-speed super computer in scalable modules networked in master-slave architecture. A large dynamic memory, user-friendly software and a TV format presentation of information makes

it readily acceptable to a community already used to viewing the fare provided by the Cable TV network.

CHOISpad is a set-top box attached with the television receiver (and linked to the computer for Internet access) which functions as a modem as well as control a signal sensor. The control signals received from the user's pointing device (i.e.) remote control are processed and forwarded to the CHOIServer to access the desired data. Received data are then screened and presented to the customer, whose identity as an authorised user is established. CHOISpad is also designed to have adequate memory to store hyper book information that has been demanded by the user so that the same once retrieved from the main server (CHOIServer) can be accessed by the user at will. The cable network at every location is not expected to be of a high standard and cable operators are least bothered if the last-mile customer has difficulty in accessing all channels. However, the reverse path needs to be so designed that control signals originating in the CHOIS pad reach the server without distortion. Therefore, CHOIS pads have been perfectly matched to the Server at the cable head-end to have a reliable reverse path irrespective of location, distance, environment and other systems functioning in the vicinity.

CHOIS remote is a pointing device specifically designed to control CHOISpad. It has a keypad similar to that of the TV/VCR remote and therefore it can also be used to control them. This device is carefully selected to eliminate the likely interference from fluorescent lights, and any EM light operating in the same room where CHOISpad is located.

With the technology in place, the emphasis then turns to content development and this is the forte of Vigyan Prasar. Having initiated the project only recently, VP is engaged in putting together a package for its intended viewers and in developing a mechanism for its regular updation, upgradation and fresh periodic inputs.

#### NCSTC PUBLICATIONS

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*Books that promote creativity and thinking abilities*

##### Leaf Zoo\*

Arvind Gupta

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##### Pumps from the Dump\*

Suresh Vaidyarajan, Arvind Gupta

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Rs.15

##### Toy Joy\*

Arvind Gupta and Ramesh Kothari

ISBN: 81-7480-003-04

pp: 28

Rs.15

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Lalit Kishore and Anwar Zafri

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pp: 69

Rs.25

##### FUN LEARNING SERIES

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ISBN : 81-7272-008-4

pp: 88

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##### OTHER PUBLICATIONS

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*(Exhibition Book)*

pp: 76

Rs. 25

##### Seeing is Not Always Believing\*

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pp: 123

Rs.65

##### Getting started in Sky-watching

K. Srinivasan

ISBN: 81-7180-045-X

pp: 53

Rs.25

\*Hindi and English

**Round-up****New Report focusses on link between global weather pattern and infectious diseases**

A colloquium convened by the American Academy of Microbiology in June 1997 comprising of an international group of scientists from a variety of disciplines including microbiology, infectious disease, epidemiology, risk assessment and climatology, focussed on the effects of weather and climate factors on the incidence of infectious diseases. One of the immediate results of the colloquium was the establishment of a research project called El-Nino-Southern Oscillation (ENSO) Experiment. Coordinated by the National Oceanic and Atmospheric Administration (NOAA), the ENSO experiment is taking an in-depth look at the effect of the most recent El-Nino. The results are to be presented in a follow-up colloquium later this year.

Recent research suggests that increases in the incidence rates of malaria, cholera, Rift valley fever and hanta virus pulmonary syndrome are associated with the effects of climate change on the pattern of infectious diseases. Satellite data have also been effective in demonstrating a link between El-Nino in the early 1990s and Cholera outbreaks in Peru and along the Bay of Bengal. Another pointer is the 1993 outbreak of hanta virus pulmonary syndrome in the Southwest United States. The increased rainfall due to El Nino led to the increased production of pinon nuts, an important food source of deer mouse, a known carrier of the hanta virus whose population increased as a consequence of its large food supplies.

Source : <http://sciencedaily.com>

**India's first bone health programme**

Doctors are preparing a database on bone density of Indians as part of the country's first bone health programme launched to provide information and medical care for patients with bone disorders.

The density measurements are being made by the first densitometer to be set up in India, at the Sanjay Gandhi Post-Graduate Institute for Medical Research (SGPGI) in Lucknow. Four U.S. made machines measure bone mineral density using X-rays.

The programme will have collaboration from the Indian Society of Bone and Mineral Research, a non-governmental organisation (NGO) comprising Indian scientists and expatriate Indian physicians in the U.S.A.. The Society plans to conduct research on bone diseases, and set up centres for diagnosis and treatment of metabolic bone diseases.

Source : PTI Science Service, Delhi.

**IRS-1C completes three years of operation**

The Indian Remote Sensing satellite, IRS-1C, which was launched by the Russian Molniya Rocket from Baikonur Cosmodrome in Kazakhstan on December 28, 1995, has successfully completed its designed life of three years. The satellite continues to function satisfactorily and there is sufficient propellant on-board for altitude and orbit control operations. Presently, the satellite is in a polar sun-synchronous orbit at an altitude of 817 km with an orbital inclination of 98.71 degrees with respect to the equator.

The 1,250 kg, IRS-1C satellite

is the world's best civilian satellite carrying a unique combination of three cameras: a) Panchromatic camera (PAN) which is a high resolution camera operating in the panchromatic band with a resolution of 5.8 kms, and a swath of 70 kms, b) a Linear Imaging Self-scanning Sensor (LISS-III) operating in four spectral bands, three in Visible/Near Infrared (VNIR) and one in Short Wave Infrared (SWIR) ranges and providing a ground resolution of 23.5 m in VNIR bands and 70.5 m in SWIR band and with a swath of 141 km and 148 km, respectively and c) a Wide Field Sensor (WiFS) with a resolution of 188.3 m and a wide swath of 810 kms. IRS-1C was joined by an identical satellite, IRS-1D, on September 29, 1997.

IRS-1C has so far completed some 15,600 orbits and the data from this satellite are being received by stations in several countries--USA, S. Korea, Japan, Dubai and Germany -- besides the Indian National Remote Sensing Agency (NRSA), Hyderabad.

The launch of IRS-1C in 1995 heralded the leadership of India in space based remote sensing which was further strengthened by the launch of IRS-ID. The planned launches of IRS-P4 (Oceansat) for ocean remote sensing, IRS-P5 (Cartosat) for high resolution mapping and IRS-P6 (Resourcesat) for resources survey in the coming years have further emphasised the commitment of the Indian space programme to retain this leadership.

Source: Press release, ISRO Headquarters, Bangalore.

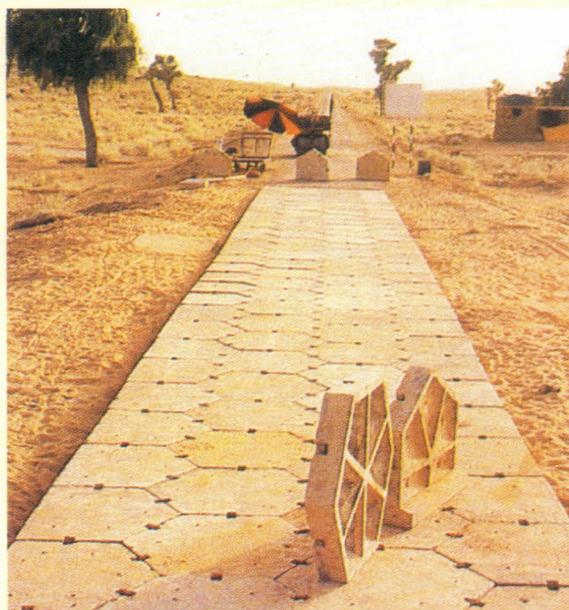
**Central Road Research Institute**

Creating appropriate road transport infrastructure is crucial



A facade of Central Road Research Institute, New Delhi

for the all round development of any country. The challenges in our own country, with its difficult terrains, are by no means small. Varying surface features from mountains to sandy deserts together with havoc caused on a regular basis by natural events such as floods, cyclones and landslides call for great innovations in highways, traffic and transport planning. The Central Road Research Institute



Precast concrete block pavement - A new pavement system for sandy terrain

(CRRI) positioned at Delhi is geared up to undertake such R&D activities. Established in 1952 as a constituent laboratory of the Council of Scientific and Industrial Research (CSIR), the institute is engaged in various research programmes in the areas of pavement design and performance, road condition monitoring, pavement deterioration modelling, maintenance planning and

management, landslide management and hazard mitigation, traffic engineering and improved transportation planning technology for urban needs, and so on. Over the years, CRRI has developed many new techniques for road construction and has extensively field tested these techniques. Besides, new materials for road construction have been evolved and recommended. We can take the example of flyash, an inevitable end product of coal-fired thermal power stations, whose disposal has remained a tricky problem and an environmental hazard. In a collaborative effort with the Public Works Department (PWD) of Karnataka, a test track of one km length was selected near the Raichur Thermal

Power Station, where flyash was used, in different sections, in different ways to gain more expertise in its use. In one of the sections, the sub base and base course were constructed using flyash and in another a rigid pavement of flyash admixed roller compacted concrete was employed. Monitoring the stretch for three years and with various other studies and collaborative efforts elsewhere, CRRI has acquired valuable experience in handling flyash as an alternate road construction material. The Institute has also provided design



Use of flyash in road construction

specifications for use of flyash in the 1.9 km eastern embankment for a newly constructed bridge at Nizamuddin, Delhi. Draft specifications on construction of roads and embankments using flyash have also been prepared. These activities come under the purview of the Technology Mission on flyash utilisation and disposal. Still on the topic of roads, it may be mentioned that survey and project implementation plans for rural transport for socio-economic development of rural areas is underway using appropriate transport technologies on the urban front, new techniques of soil stabilisation and

strengthening procedure for better road transport are being explored.

Landslides, common occurrences in the Himalayas, cause loss to life and property. CRRI has designed and developed an Engineering Database on landslides (EDBLSD) which will be of great

help in proper planning, design and management of highway networks in these regions.

Likewise, development and promotion of jute based Geotextile tiles for stabilising road side slopes in landslide prone areas and regions with soft silky clay soil with a tendency of submergence during high tide

(example: Kakinada); deterioration and rehabilitation of bridge superstructure using different anti-corrosive coating on reinforcements and usage of new materials like high modulus fibres (FRPs) for strengthening old bridges, are just a few of the varied projects receiving attention at CRRI.

### Kyon Aur Kaise (Why and how?)

As we go about our day to day business, we cannot but notice certain things that intrigue us. *What if you decide, all of a sudden, to climb the hill near your house. How could your legs get stiff and painful the next day? What causes breathlessness and stiffness after strenuous exercise? Or why do we get tired? And then, sometimes, how are those inconvenient hiccups caused? If nature fascinates you, have you ever wondered how water reaches the top of a tree? Again if bird watching is one of your hobbies, how do migratory birds find their way to exactly the same location every year? Kitchen can also throw up quite a few challenges: why do drops of water dance about on a hot plate? Why are there two layers in a chapaatti? Why does liquid run down the side of a container when it is poured gently?*

If one just lists down all the questions that arise on careful observation, even for a day, one would have so many of them that finding answers would necessitate running to the nearest library. The above mentioned questions alongwith many others are addressed in one of our publications "Kyon Aur Kaise?". The book is actually based on

NCSTC's TV serial of the same name. Portions of this serial are currently being telecast on DD1 on Thursdays (10-10:30 AM) in an educational television programme "Tarang", encapsuled by the Central Institute of Education Technology (CIET), NCERT.

Surely one or more questions have cropped up in your mind, answers to which have not been so easy to come by. If so, we invite you to share your questions with us. We promise to answer them by seeking help from experts, if and whenever necessary. Further select questions and their answers will appear in our column "Kyon Aur Kaise?" which we will initiate as soon as we have your questions. Until then would this interest you?

#### Why are winter days cold?

Do send in your answers to:

#### Kyon Aur Kaise

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