Monthly Newsletter of Vigyan Prasar

# DREAM 2047

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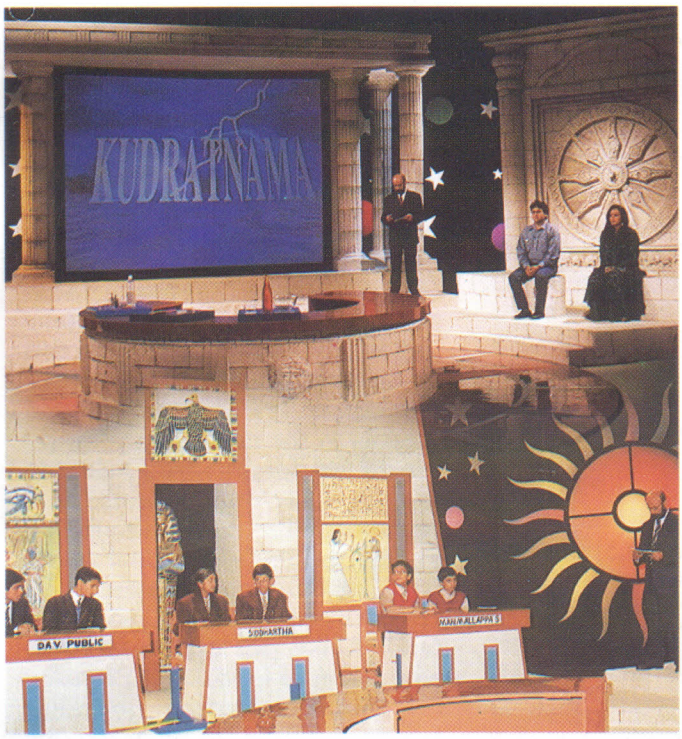
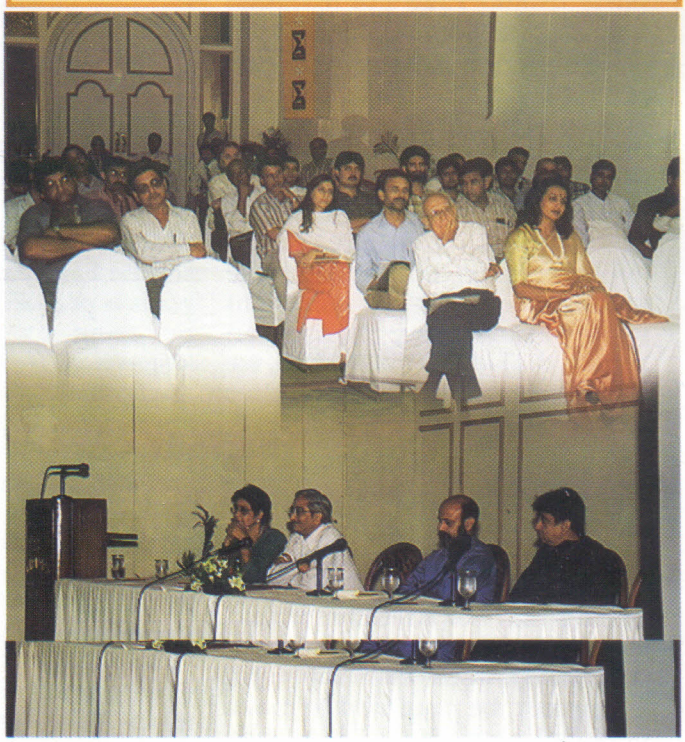



*Scenes from NCSTC's "Kudratnama", a 27 episode TV Quiz serial for school children.*

## Inside



As per the directives of the Office of the Registrar of Newspaper's of India, the October issue of "Dream 2047" will be considered as issue No. 1.



*Scenes from the Press Meet on "Kudratnama" which has been captivating children of the Indian Sub-continent and the Middle East since March 1998. The Meet was jointly organised by Vigyan Prasar and Star Plus in New Delhi on September 12, 1998.*

## VP News

### Our very first CD-ROMs

The first two multimedia titles – Interactive CD-ROMs on "The Rustless Wonder: An Interactive CD ROM title on the Iron Pillar at Delhi" and "Mad, Mad, Mad Cow – An overview of the Mad Cow Disease" are now available. Both these CDs are based on our publications and more details are included elsewhere in this issue.

### Environmental Hotspots

Under this new series, as part of our information system, VIPRIS, Vigyan Prasar hopes to draw attention to sensitive environmental issues/projects that have caused concern and triggered much debate and controversies in recent years. The first volume of the series is on "Tehri Hydro-Electric Project" and "Narmada Valley Project" and is compiled by Dr. Jagdish Bahadur. This is the latest addition to our list of publications.

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

## GOALS FOR INDIA !

Have we, the people of India – that is, Bharat – set ourselves "national goals" to be achieved by specific deadlines? Not really! Isn't it about time that we did? I believe it is and we should!

Would that help us achieve more, or at a faster pace, than before? After all, we have had goals and objectives in the past, even if we did not formally list them at one place, or get them passed as a resolution by the Parliament.

Yes, I believe it would! The closest we came to doing what is being suggested here is when the so-called National Technology Missions were launched with some sort of time-frames. It is not as if no work on literacy, drinking water, immunization, oil seeds, tele-communications etc., was going on prior to the launching of fairly specific missions on these subjects. But as a result of the missions, there is no question that brisker progress was made on these fronts. Take the National Literacy Mission, or the Mission on Tele-communications, for example. We did achieve a great deal more and faster than had been possible earlier. Perhaps we have not succeeded fully because after initial successes, these missions and/or the methodology of their implementation did not receive the kind of backing or commitment with which they had been launched. Had this not been so, we might have achieved even better results.

We are speaking here of "national goals"– goals that every Indian, irrespective of his/her ideological, religious or political leanings, would be proud to see achieved during his/her lifetime; would even be willing to work for or contribute towards their fulfilment; and would be prepared to make personal sacrifices if necessary towards achievement of at least some of them!

What sort of goals are we talking about? Who should draw up a list of such national goals and how? Having drawn up a list, who should prioritize them and how? Answers to these questions are important, nay crucial, and could determine whether or not these goals would get fully achieved within the timeframes envisaged.

The goals on the list would have to be of the type which motivate and inspire, which are really challenging and appear at first sight to be a bit beyond our present reach and capabilities – and to some sceptics, even impossible to achieve! The goals to be set should also be of a kind with which many an Indian would be able to readily associate personally. In other words, every goal ought to make people think and feel as if they themselves had set it for the country! This itself would tremendously enhance chances of their achievement. Words of caution before we go any further: In India, we are quite adept at devaluing and finishing off every good thing by overdoing it! We did it with the "missions" as well! Let's not do it with the "national goals" we are discussing here.

Let's return to the question of specification of "national goals" which will answer to all the descriptions that we have discussed above. Actually, it should hardly matter how a list of goals is prepared. It could actually be done by openly inviting suggestions from all quarters. What really matters is the methodology we adopt to finalize the list, assign relative priorities to different goals, and to decide on the small number — even one — of the goals, to go after for realisation within a specified time-frame (which, initially, should be as short as possible — say, a year or two!). Once we really and truly realise even a few goals on the list, the momentum, the confidence, the inspiration and the motivation this can generate, would be factors which would greatly facilitate realisation of more goals on the list, and in a much shorter time than it took to realise the first few!

The finalisation of the list of "national goals" and assignment of relative priorities ought to be done by national consensus. Thereafter, a resolution setting out "national goals" ought to be passed unanimously by the country's Parliament. The central government should then pick one or a few goals on the list at a time and make the whole country go all out after its/their realisation by a preset deadline.

Let me mention some "national goals" which in my view are eminently fit cases for inclusion in the list – and all of us are acutely aware of them : (i) Make India power surplus in 3 years; (ii) Make India fully literate in 2 years; (iii) Clean-up all cities in 2 years (like Surat did); (iv) At least two gold medals in the next Olympics; (v) World leadership in 2 selected science & technology areas in 5 years; (vi) Eliminate malnutrition in children under five in 3 years; (vii) Total computerisation of all government functions in 5 years; (viii) Raise per capita GNP to equivalent of US $1000 in 8 years; (ix) Eliminate unemployment among educated youth; plus more!

The list is perhaps endless. We need to set and achieve goals in a way that the list would become shorter with time. With the way we have been going – i.e. taking up all problems at the same time and tackling them half-heartedly, and with insufficient and subcritical effort in each case — we don't see a single problem getting resolved fully or truly and forever. In fact, the list is only getting longer and many of the persistent problems becoming even more acute and intractable, leading to despair, hopelessness and frustration. We must reverse this trend, if we are to build the India of our dreams.

We would love to hear from our readers.

NKS

## AUDIO-VISUAL PROGRAMMES

We introduce readers to another facet of Vigyan Prasar. The Publications Programme and VIPRIS have their own places of pride in Vigyan Prasar. But our audio-visual programme is slowly but surely establishing itself as a significant part of the whole. The reasons are not far to seek. Thanks to the proliferation of satellite TV channels and AM & FM radio stations, television and radio offer viewers/listeners a wide choice of programmes on a whole range of topics. Though the programmes are presently mainly entertainment-oriented, they also need to address the information needs of the people. As far as science coverage is concerned, it is sporadic, and uneven, especially on television. S & T features, documentaries, interviews and science films are rare on Doordarshan. However, in addition to these sporadic programmes, intensive and continuing efforts are necessary to improve television viewership tastes and bring about an attitudinal change towards science. There is thus a need to plan and conceive of programmes that can arouse and sustain interest and also result in some involvement on the part of the audience.

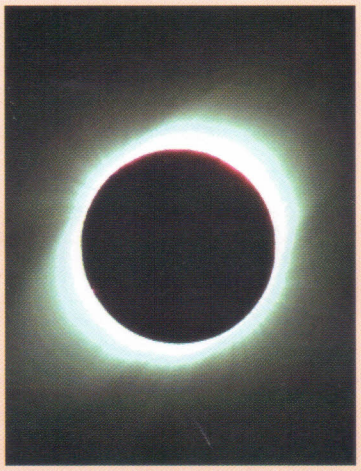
Inspired also by the run away success of the radio serial "Manav Ka Vikas" – a joint production of NCSTC and AIR, providing a lucid account of the story of human evolution and progress thus far – or the widely acclaimed telecast of the NCSTC's film-serial "Bharat Ki Chaap" – a production which dwells on the history of science and technology in the Indian subcontinent, Vigyan Prasar's audio-visual programme is striving hard to enhance science coverage on both television and radio. Its recent programmes are a step in this direction. Be it "Paryavaran Calling" – a phone-in quiz on environment from Bhopal, or "Chhoo-Mantar" – a weekly radio programme from Akashvani Delhi on science behind miracles, Vigyan Prasar hopes to capitalise on serialized broadcasts to bring about a greater involvement of people. Going by the experiences gained in the former case, which is a phone-in quiz currently being broadcast twice a month from all AIR stations of Madhya Pradesh, the effectiveness of the radio broadcast in reaching out to people, even in far-flung areas, has been amply vindicated. The programme aims at creating awareness of the local environment and issues pertaining to it. The phone-in component is an attractive feature. To overcome the drawback of phone-ins being limited to only the local callers, different episodes are being broadcast from different AIR-stations of MP. This provides for larger participation, especially in the phone-in component. As a trade-off, the compilation of questions with answers in print form would be really useful. Would it not be a good idea to have similar exercises in other states? Vigyan Prasar is attempting to do just that!

Exposure to environmental issues and promoting people's participation in movements for its conservation are no doubt an important task. Equally important is the task of ridding people of superstitious beliefs and blind faith. The ongoing radio serial "Chhoo-Mantar" envisages this and is being broadcast weekly from AIR, Delhi. Each episode aims at dramatizing a situation involving so-called miracles and their effective debunking with scientific explanation(s). Listeners also get to respond to a connected question asked at the end of each episode. Further, to encourage participation and ascertain the level of interest, a registration procedure is adopted where the registrants get to receive posters and other supplementary materials.

Many more such programmes are in the offing. On the television front, Vigyan Prasar is making inroads into the telecast mode. Opportunities best suited for this mode do present themselves on occasions, as in the case of the total solar eclipse of 1995, when a



Eclipses have often been viewed with awe. This is especially true of solar eclipses and if one is fortunate to view a total solar eclipse, the experience can truly be breathtaking. A curious mind is of course working overtime to comprehend the event. At the same time stories and myths, perhaps heard or read over the years make one wonder why a great deal of importance and mysticism is associated with the event. Various attempts have been made to create adequate awareness amongst people. In fact, concerted efforts of NCSTC and Vigyan Prasar during the 1995 solar eclipse spearheaded a nationwide awareness campaign, which attempted to demystify the phenomena. Another opportunity is almost round the corner – the century's last total solar eclipse (TSE). Efforts are on to launch a similar but bigger campaign and we are in the process of equipping ourselves with



appropriate software. Besides publications and awareness programmes, we plan to author a CD-ROM on eclipses. Through this forceful medium with its features like animations to explain concepts; visuals, photographs, maps and video clippings to provide almost a real-life experience, we hope to meet the demands of both children and adults. We would appreciate if our readers would react to this and share with us their experiences. We would be interested in the myths and legends prevalent in different regions and cultures; for, we are sure that the vast cultural diversity of India would have generated many. We would also be interested in photographs, and (information about or) video clippings, which could help in enriching our proposed CD. We would be happy to receive your responses as soon as possible.

majority of the masses were either not aware of the phenomenon or were bogged down by superstitious beliefs. Exclusive programmes on this event helped, to a large extent, to draw people out and bring about their wholehearted participation. Vigyan Prasar contributed its mite via a number of spots and short films produced to explain the phenomenon and dispel the many myths prevalent. More importantly, the guidelines provided for safe viewing and the "Dos and Don'ts" were very effective in motivating more and more people to view the rare event safely. These films have definitely not outlived their utility; for, the country is once again preparing for the last total solar eclipse of the millennium, due August 11th next.

Apart from event specific programmes, Vigyan Prasar also has plans to produce and telecast TV programmes on a regular basis. A beginning has already been made. Our recent titles include programmes on Herbal Petrol and Dhoomketu (for Comet Hale-Bopp). Many more are under production and in the pipeline.

### OTHER ACTIVITIES OF VP

Those were the major programmes. But that is not all. Science popularisation provides a wide canvas and there can be many more equally exciting programmes. Some of our recent ventures include, setting up and networking of science clubs and intensive popularisation of electronics and electronic hobbies such as HAM radio, which we will be introducing in our forthcoming issues.



We would like to thank our esteemed readers for their interest in DREAM 2047.

We are overwhelmed by the responses. We have plans for a Popular Science section, and it is heartening to note that many of our readers share our views. Requests for information on India's S&T achievements, recent developments, better science for better living, etc. are pouring in. We hope to cater to these and also to many other specific ones. Do Watch out for the popular science section to be added shortly to DREAM-2047.

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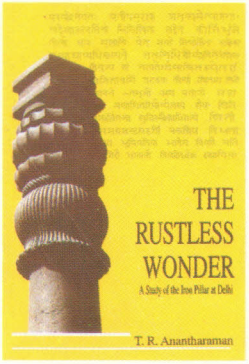
## Bookworm

### The Rustless Wonder – A Study of the Iron Pillar at Delhi

*By T.R. Anantharaman*




Price: Rs. 350

Pages:141+xviii

The Iron Pillar located in the vicinity of the famed Qutab Minar has been an object of perennial interest and curiosity for scientist and lay-persons. It has remained an enigma for centuries mainly on two counts: first relates to the technology by which a metallic object of such a large size and mass could be fashioned so many centuries ago, and the second has to do with its phenomenal corrosion resistance despite exposure to sun, rain and wind for so long. The book review of R Parthasarathy from The Hindu brings forth the salient features vividly.

### Book Review

This book is the first of monographs in the series on India's Scientific Heritage by Vigyan Prasar, a society registered in 1989 under the Department of Science and Technology (DST), Government of India. The aim of the latter is to disseminate scientific information on a popular level. There can be no better subject to launch this series, than the famous monument, the Iron Pillar at Mehrauli village, not far from Qutab Minar.

This metallurgical marvel has evoked the admiration of antiquarians like James Prinsep (1838) and the academic curiosity of scientists. It has always been a tourist attraction.

One of the great joys of reading this book is that the subject treated is both ancient and very modern. It is ancient because the pillar has survived 15 centuries and is still in an excellent state of preservation. It has attracted the serious attention of researchers since James Prinsep published the first important paper in the Journal of the Asiatic Society of Bengal. The pillar was permitted to stand on its original location in the precincts of a mosque which was created out of a temple, presumably built for Lord Vishnu.

The book is divided coherently into two sections, chapters I to III tracing the history of the pillar and IV to VI dealing with the mode of fabrication and the metallurgical studies on its astonishing corrosion resistance.

The author marshals in chapter III all historical and archaeological facts and establishes that the king referred to in the inscription on the pillar could be none other than Samudra Gupta and the pillar was erected around 375 A.D.

The Iron Pillar is actually a Flagstaff (Dhvajastambha) in a temple dedicated to Lord Vishnu by King Samundra Gupta; the monarch who got the inscription (prasasti) composed and engraved was his son Chandra Gupta II. The choice of an inauspicious metal such as iron in a holy place is unusual which conforms to the premise that the builder could only be a great warrior and a specialist in weapons.

In Chapter IV a rapid survey of metal working is given leading to the blast furnace evolution for the smelting of iron ore and our country's most significant contributions (since around 1300 B.C.) to iron technology.

The metallurgical studies by leading laboratories in the country during the three decades (1962-92) are critically examined in chapter V. The trail-blazing paper of M.K. Ghosh (1963) following elaborate chemical, X-ray and microscopic studies and the comprehensive review by G. Wranglen (1970) are cited as the best references for knowing about the fabrication technique adopted. So it is concluded. "Judging from the weld-lines visible on the surface the Delhi pillar seems to have been built up from a great many lumps weighing 20-30 kg each, successfully forge-welded together under firing with a charcoal blast. The surface of the pillar still retains marks of hammer blows...." The chapter ends with an expressive sketch giving an artist's impression of the ingenious mode of fabrication.

The next chapter deals with the amazing corrosion resistance exhibited by the pillar despite the onslaught of severe climatic and environmental changes over 1500 years which has been referred to as the "rustless wonder". It has been established beyond doubt that the good state of preservation of the pillar is mainly due to a protective film of corrosion-resistant products. The Iron Pillar thus stands as a staggering piece of engineering which has made an impact on modern technologists.

Prof. Anantharaman has brought out an erudite, well-referenced eminently readable text. He has explained with verve the key concepts - metal working, corrosion, chemical composition, electro-chemical reactions, ferrous physical metallurgy and non-destructive testing. The book is lavishly illustrated with six picturesque colour plates.

The book maintains the interest of the reader except some paragraphs in pages 8-10 and 53-54 which are disjointed with the theme of the study.

A brief history of Samudra Gupta and an English translation of the main inscription on the pillar will enhance the value of the book.

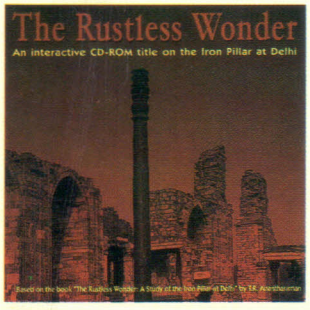
The book will be a good source material for students launching on a research degree in metallurgical, chemical or mechanical engineering. It should find a place in every college library.

***R Parthasarathy, The Hindu***

About the author: Professor T. R. Anantharaman, was formerly the Head, Department of Metallurgical Engineering; Director, Institute of Technology and Rector, Benaras Hindu University, Varanasi. In recognition of his outstanding research contributions in Metallurgy and material Science, Oxford University conferred on him the D.Sc. degree in 1991. Professor Anantharaman has been nationally and internationally acclaimed and hounoured for his very many contributions.

## CD ROMs

With a view to capitalizing on the multimedia technology to package information in an appealing manner, Vigyan Prasar embarked upon the production of CD-ROMs. To make a beginning, two of its own publications were chosen to bring out their multimedia versions. The choice of books was dictated by their popularity and the need for multimedia techniques for better visual impact. The Rustless Wonder – A Study of the Iron Pillar at Delhi and Mad, Mad, Mad Cow – An Overview of the Mad Cow Disease (reported on the inaugural issue) were easy choice to make.


These CDs, which follow closely the publications, attempt to clarify the more technical and difficult points in these books. Simple and easy to read text with visual enhancements like photographs, animations, videos and self-explanatory animated diagrams and graphs enhance the educational experience. The glossary, indexes and bookmarking facilities are of great utility. A full-featured help screen is available at all points. The Mad, Mad, Mad Cow CD also has an auto-run demonstration which provides a quick overview.

***The minimum recommended configuration for both the CDs is a 486 PC with multimedia capabilities.***

## VIGYAN PRASAR PUBLICATIONS

### Science Biographies

*Memoirs of Ruchi Ram Sahni*
*Pioneer of Science Popularisation in Punjab*
Editors : Narender K. Sehgal and Subodh Mahanti
ISBN : 81-7480-016-6
pp: 264+xxxvi — Rs.60

### Science Classics Reprints

*The Chemical History of a Candle*
Michael Faraday
ISBN : 81-7480-002-6
pp:146+xx — Rs.35

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### India's Scientific Heritage series

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*A Study of the Iron Pillar at Delhi*
T. R. Anantharaman
ISBN : 81-7480-015-8
pp: 141+xviii — Rs.350

### Environmental Hot spots

*Tehri Hydro Electric Project*
*Narmada Valley Project*
Jagdish Bahadur
ISBN :81-7480-043-3
pp. 138 — Rs. 125

### Other Publications

*Kyon Aur Kaise?*
Partha Ghose, Dipankar Home & Narender K. Sehgal
ISBN :81-7480-019-0
pp: 113 — Rs.149

*Mad, Mad, Mad Cow*
*An overview of the Mad Cow Disease*
Kunal B. Roy and Santosh K. Kar
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pp:197+xxv — Rs.95

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