

Monthly Newsletter of Vigyan Prasar



# DREAM 2047

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## VP News

## Inside

### Hello Stars

Vigyan Prasar released its latest book entitled "Hello Stars". It is about night sky watching. The book release ceremony was held on 10 October 2001 in the Raman Auditorium of Technology Bhawan, DST, New Delhi. The audience comprised of scientists of DST, authors of Vigyan Prasar publications, school teachers, students and some enthusiastic sky-gazers. Amongst the dignitaries present on the dias were Prof. V.S. Ramamurthy, Secretary, DST; Prof. Rajesh Kochhar, Director, NISTADS, who presided over the function; Mr. Anuj Sinha (Head, NCSTC), Dr. V. B. Kamble (Acting Director, VP) and the author, Mrs. Usha Srinivasan.

Dr. V. B. Kamble in his welcome address gave an account of the activities of Vigyan Prasar with emphasis on publications. Mr. Anuj Sinha highlighted the need to publish books that would generate wider interest in the youth of the country. The book was released by Prof. V.S. Ramamurthy. Speaking on the occasion, Prof. Ramamurthy emphasized that the best laboratory one can ever work in is out in the open. Nature is the best educator. Prof. Kochhar delivered the presidential address. He said that children with their curiosity are perhaps the best scientists.

The author was introduced by Mr. Arup Kumar Misra and the function was compered by Dr. Subodh Mahanti, who also gave a vote of thanks.

Mrs. Usha Srinivasan's introduction of the book was full of her interesting experiences that led to her decision to compile them in a book form, thus "Hello Stars".

The book "Hello Stars" aims at enthusing the students by making the subject of night sky watching interesting. The language is simple and lucid. The book informs the readers about scientific facts of astronomy along with providing interesting insight into myths and popular beliefs about stars and constellations. "Hello Stars" contains seven chapters: 'The Night Sky'; 'The Zodiacal Constellations'; 'Let us make Friends with Stars'; 'Stars, Constellation and Festivals'; 'Astronomy in India'; and Hello Stars, How are you?

To make the reader comprehend the various aspects of astronomy provided in the book more clearly, some simple models and projects are given towards the end. The book has been the result of a project on popularisation of astronomy.

### EDITORIAL

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☞ Recent developments in Science & Technology



At the book release function of "Hello Stars", Prof. Ramamurthy presents a copy of the book to the author Ms. Usha Srinivasan. Also seen in picture are Dr. V. B. Kamble, Director, Vigyan Prasar and Prof. Rajesh Kochhar, Director, NISTADS (extreme right)



A section of the audience at the book release ceremony

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

## No Longer Hypothetical

Not even a month had elapsed since the deadly attacks on the World Trade Centre twin towers in which thousands perished, when the fear of yet another attack gripped the U.S. But, this time it was a different story altogether. It was the human exposure to the dreaded anthrax bacteria that escalated the long-felt fears of the possible deployment and use of biological weapons in warfare. Now it seems that this fear is no longer hypothetical.

Till a few years ago, talks on chemical or biological terrorism began this way: "if a chemical or biological attack were to take place ....."! The attack on the Tokyo subway system in 1995 in which the nerve gas sarin was unleashed by the Aum Shinrikyo cult, preceded by the one in 1994 against the city of Matsumoto, changed all that. If a chemical attack is frightening, a biological weapon poses a worse nightmare. The small quantity of anthrax needed for a lethal inhalation dose can be easily concealed, transported and disseminated. Odourless and invisible, it makes a very stealthy killer. In theory, a kilogram can eradicate hundreds of thousands of individuals living in a metropolitan area, but for the inactivation or degradation when released in the environment. Further, anthrax spores can be stored for decades without losing their viability. Unlike chemical agents which are inanimate, bacteria and viruses may be contagious and reproductive. If they become established in the environment, they may multiply and unlike any other weapon, may become more dangerous over time.

Certain biological agents incapacitate, whereas others kill. Biological weapons can range in lethality from salmonella used to temporarily incapacitate to super bubonic plague engineered for mass casualties. Biological agents may be used to kill or disable humans or to attack plants or animals to harm a nation's economy. The Ebola virus, for example, kills as many as ninety per cent of its victims in about a week. For Ebola, there is no cure, no treatment. Biological weapons may include even toxins which are deadly substances originally produced by living organisms.

What is alarming is the fact that production of biological or chemical warfare agents is certainly within the reach of a dedicated and skilled group, and it does not require the resources or the technical assistance of the State. Much or all of the necessary production equipment and technology is available in the open market. Many deadly agents, including anthrax and plague can be found in nature. Given an initial biological culture, anyone who can brew beer can probably grow biological warfare agents. Even so, the entire process of producing and disseminating chemical or biological agents is not so trivial, and may require certain degree of knowledge and skill. Making biological weapons requires sample cultures; the means to grow, purify, and stabilize them; and the means to reliably disseminate them. In fact, it is said that in some countries, efforts are already on to build arsenals of biological

weapons. Further, advances in genetic engineering and molecular biology could make it possible to develop a "super-pathogen" in a laboratory resistant to any known drugs or antibiotics.

Given that there are at least some people or groups in the world who would actually use these agents against civilians, what could be done? True, this is hitherto an unknown dimension of warfare. To effectively counter the terror of these germs of war, it would be necessary to exchange information and resources in a coordinated manner. When a biological attack takes place, what is required is the information on the source of the agent causing these attacks on the individuals, charting out of preventive measures, and a high level of preparedness to face up to the challenge posed by the micro-organisms released. It is equally important to initiate coordinated international efforts to curb the possibility of terrorist groups either developing or gaining control over chemical or biological weapons.

Most important, it would be imperative to improve the public health infrastructure in the country. Bhopal gas tragedy; and dengue and plague epidemics that broke out a few years ago in our country (hope they were not acts of bio-terrorism!); provided a glimpse of what a chemical or a biological warfare could be like. Remember to what extent the public and private health systems got stretched? Remember the fear and panic caused on all these occasions? In order that we are not caught unprepared, we need to begin drawing up contingency plans and formulate a comprehensive public health policy to counter such attacks. This may include replenishing expired stocks of vaccines and drugs (they have a limited shelf-life!), antidotes, replacing obsolete or expired equipment and so on. In addition, it would be necessary to pursue development of equipment to detect and identify the chemical or biological agents, to protect individuals from exposure, to decontaminate affected people, equipment and locations, and to provide medical treatment to the victims. We can perhaps never eliminate the possibility of chemical or biological terrorist attacks, but these activities will make us better equipped to respond to one, should it ever occur.

There is no gainsaying the fact that the vigil and the public confidence are of paramount importance in countering any chemical or biological attacks. This is possible only through a massive information campaign using all the media at our disposal, and through public lectures / demonstrations encompassing aspects like basic information on agents used in chemical and biological warfare, preventive measures, and responding to the attack should the prevention fail. For science communicators, this is both a challenge and responsibility. Let us get on with it. The threat is real.

□ V.B. Kamble

Editor : V.B. Kamble

The team : Vigyan Prasar Staff

Vigyan Prasar

Address for correspondence : C-24, Qutab Institutional Area, New Delhi-110 016  
Tel. : 6967532; Fax : 6965986  
e-mail : [vigyan@hub.nic.in](mailto:vigyan@hub.nic.in)  
website : <http://www.vigyanprasar.com>

