

PROFILE OF THE INDIAN SCIENCE CONGRESS ASSOCIATION

The Indian Science Congress Association (ISCA) is a premier scientific institution established in 1914 primarily for the purpose of providing a common platform to Indian scientists, engineers and technologists of all categories and belonging to different disciplines for sharing expertise and experience. The Association has been actively spreading the message of science among students and scholars all over the country and, in a way, helping the spread of a scientific temper among the people at large. The Annual Sessions of the Indian Science Congress provide opportunities to Indian scientists, and particularly those from younger generations, to come in contact with their seniors as well as their counterparts in developed countries, thus providing a very important input into the growth of Science in India. ISCA brings together scientists both from India and abroad for mutual interaction in the cause of national development. Ever since 1914, an annual Congress of the Association has been held every year with a very distinguished scientist as the General President. During the annual session of ISCA, representatives from similar associations throughout the world participate.

The objectives of the Association have not undergone any major change since 1914, though the scope of activities has increased. The objectives of the Association are as follows :

- (i) to advance and promote the cause of Science in India;
- (ii) to hold an Annual Congress at a suitable place in India;
- (iii) to publish proceedings, journals, transactions, etc.;
- (iv) to popularise Science.

The first meeting of the Congress was held from January 15-17, 1914 at the premises of the Asiatic Society, Calcutta, with the Honourable Justice Sir Asutosh Mookerjee, the then Vice-Chancellor of the Calcutta University, as General

President. One hundred and five scientists from different parts of India and abroad attended and the papers numbering 35 were divided into six sections. Since then, many renowned scientists/ academicians from India and abroad have presided over Science Congress Sessions (Annexure-I).

From the modest beginning, with 105 members and 35 papers communicated for reading at the first session, ISCA has grown into a strong fraternity with more than fourteen thousand members. The number of papers communicated for reading often exceeds two thousand now. There are at present fourteen sections and one committee.

The year 1976 witnessed a significant breakthrough in the totality of deliberations in the Congress. It was being felt for sometime that such a gathering of scientists covering a wide spectrum, ought to be seized of national issues that have scientific and technological implications. Dr. M. S. Swaminathan, the then General President of ISCA, introduced the Focal Theme of national relevance which is now discussed during the annual session and several plenary sessions are organised around various facets of the Focal Theme in which scientists and technologists as well as policy makers and administrators interact with one another. ISCA has thus become a platform where members from different disciplines and from different walks of life can contribute to discussions on the Focal Theme.

In 1980-81, the Department of Science and Technology, Government of India, constituted a permanent Task Force involving representatives of ISCA and Chiefs of different agencies and voluntary organisations who are responsible for implementing various recommendations on the Focal Themes. Every year follow-up actions on recommendations made in the previous Science Congress are discussed at a general session during the annual

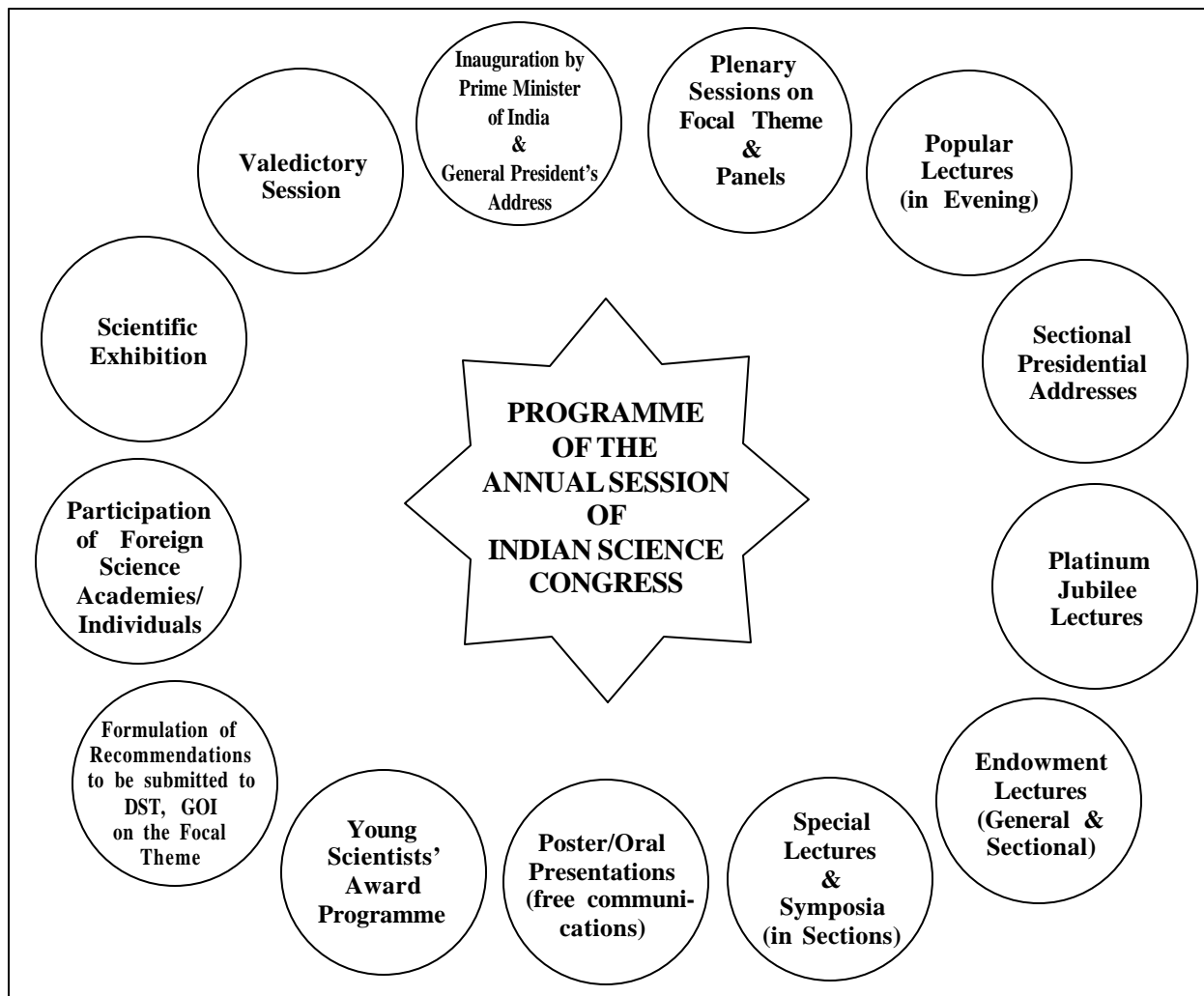
Congress. Thus, ISCA to-day is involved not only in the development of Science and Technology in the country but also plays an important role in the formation of National Policy on Science and Technology of the country. On the basis of the recommendations emerging from the deliberations made during the Science Congress Sessions, the Government of India has created new Departments, made several changes in the rules of business in different existing Departments and taken several concrete measures to promote causes of Science in India.

ISCA introduced a programme for the benefit of young scientists from the 68th Session of the Indian Science Congress in 1981. The programme enables young scientists to present their proposed research work with opportunities

to exchange ideas in the relevant scientific problems with their counterparts and specialists. For excellent presentations, upto 25 such scientists are given ISCA Young Scientist Awards.

Further, to encourage young scientists it was decided that some of the contributed papers on the basis of a careful screening to be done by the concerned Sectional Presidents with the help of some experts will be presented mostly by way of posters and at most two Prizes be awarded to the best Poster presentation in each Section from 1999 Session. Oral presentations of some selected contributed papers are also included in the programme of each section.

The programme of the annual session of the Indian Science Congress is generally planned as in the following chart :



THE NINETY SECOND INDIAN SCIENCE CONGRESS

Inauguration

The 92nd Session of the Indian Science Congress was held at Ahmedabad under the joint auspices of the Nirma University of Science & Technology and National Institute of Occupational Health (NIOH) from January 3 to 7, 2005. Hon'ble Prime Minister of India Dr. Manmohan Singh, inaugurated the 92nd Indian Science Congress in the afternoon of January 3, 2005 and Prof. N.K. Ganguly, Director-General, Indian Council of Medical Research, New Delhi, and General President, The Indian Science Congress Association presided over the function. About 4000 delegates from Indian and abroad attended the Congress.

The inauguration ceremony was started with invocation and presentation of Bouquets. Dr. N.V. Vasani, Vice-Chancellor, Nirma University of Science & Technology and Chief Patron 92nd Indian Science Congress delivered the Welcome address.

Shri Narendra Modi, Hon'ble Chief Minister of Gujarat, gave an address. He narrated some of the scientific achievements of his state. He stated that the Gujarat government has created an independent Department of Science and Technology in April 2003, in order to ensure a unified effort for development. Besides the Physical Research Laboratory, Gujarat hosts the Bhaskaracharya Institute for Space Applications and Geoinformatics, which is entrusted with pioneering work in areas like remote sensing applications for inventory, mapping and monitoring of natural resources to enable effective developmental planning, facilities for digitization and optical enlargement for preparation of thematic maps and photo interpretation of satellite images. Shri Modi also stated that Gujarat has the largest operational optical fibre cable network of more than 35,000 km, the highest number of internet service providers, more than 60 MB of band

with through five internal gateways and a growing culture of computer usage. The Gujarat State Wide Area Network, connects all the 25 districts and the 225 talukas. With 12,000 nodes, it is the largest wide area network in the Asia Pacific. Focusing on the theme of the Congress, Shri Modi said that advice on health care can now be taken to the doorsteps of the common man at very little cost, due to advances in communication.

Pt. Naval Kishore Sharma, His Excellency Governor of Gujarat also addressed on this occasion.

Shri Kapil Sibal, Hon'ble Minister of State for Science & Technology and Ocean Development, Government of India, while delivering his address said "I am referring to the aftermath of the earthquake of 8.9 Richter Scale in Sumatra and the all-consuming Tsunami engulfing the region bringing with it death and destruction. More than a hundred thousand persons have died. The Tsunami silently and stealthily at the speed of sound moved towards Andhra Pradesh, Tamil Nadu and Kerala after causing untold devastation to the Andaman & Nicobar Island. This massive shock has caught us unawares. Those who have suffered are mainly the poor and the less advantaged. Mere consolation is not adequate; we must rehabilitate them. We must provide them shelter, means of livelihood, education and health facilities. In the long term science has to come to our rescue for understanding the designs of nature, foretelling them and devising methods for reducing the damage and post disaster management, even if the investments required are high.

Since the dawn of civilization the natural phenomenon of earthquakes cannot be predicted in the short term by science with any amount of accuracy. The complexities of nature leave us in wonderment. Despite the erudition

of the scientific community, nature has a way of humbling us. And yet, perhaps, the only means of understanding this phenomenon is through science, through discoveries and the use of technology. On December 26th 1947, Pt. Jawaharlal Nehru addressing the Indian Science Congress Association stated, 'The future belongs to those who make friends with Science'. There is message in that sentence.

The universe around us is orderly. It is the intervention of man constantly at odds with the universe that seeks to disturb that orderliness. Far too long have we in the past sought to exploit nature. But nature has a way of retaliating. The more we consume nature's vital and valuable resources, for temporary gain, the harder it gets for us to combat the consequences of the resultant phenomenon. The over exploitation of fossil fuels increases levels of carbon dioxide. The consequential destruction of the environment will take years, if not impossible, to reverse. The depletion of the ozone layer, the indiscriminate use of chemicals and their negative impact on nature, the destruction of flora and fauna, the consequential rise in global warming, the depletion of potable water and the indiscriminate use of natural resources without a care for the consequences are all examples of our conflict with nature. It is Albert Einstein who once said that, 'Scientists were rated as great heretics by the church, but they were truly religious men because of their faith in the orderliness of the universe.' The scientific community must renew its efforts to understand and appreciate the orderliness of the universe, retain it and work with nature rather than combating it. It is only a man of vision who will stray away from the trodden path. I stand here proud of the fact that a man of vision had in 1991 embraced liberalization to release the energies of almost a billion people by embarking upon a path of new opportunities for us. The benefits of the liberalization process are being reaped today and the Indian Economy is moving ahead on

a growth curve, which will eventually touch 8 percent of GDP. The scientific community must also move away from trodden path onto a new road to discovery and invention through use of technologies in collaboration with nature for the good of humanity.

As the liberalization process moves forward there is a raging debate about the benefits of the process. Many argue that the benefits have not trickled down to the poor. We as a people live with unacceptable levels of poverty. Almost 50 percent of the children born in this country are malnourished. Despite more than 55 years of independence, the rates of illiteracy are close to 40 percent and are much higher for women. The poor still do not have shelter, drinking water, electricity and sanitation facilities. Farmers commit suicide when confronted with drought and the avarice of moneylenders. The rate of maternity deaths has not decreased substantially. The spread of tuberculosis and malaria are impoverishing the poor further and HIV/AIDS, is a time bomb, yet to explode. It is ironic that despite the Information Technology revolution and the consequential prosperity knocking at the doorsteps of a small section of the population, the poor still cannot bear the burden of poverty. Sometimes, the ways of nature seem irrational, for nature too also targets the already impoverished. I cannot help but remind you of the cruelty of the Tsunami which too affected the poor in the coastal areas, left families homeless and destitute, destroyed *kutcha* houses with its fury and threatened to spread disease and pestilence again targeting the poor in its aftermath.

It is imperative that Science must provide solutions for the common man. Technology must not bypass the common man. Science must provide acceptable solutions for the mass of humanity. It is true that the launch of satellites and the detonation of the atomic bomb might make our Nation proud as it signifies the advancement of our scientific community in high technology areas. Our Nation

is also proud of the fact that we are the leaders of the world in Information Technology, that our automobile and the auto-component industry has come a long way, that our pharmaceutical establishments produce world-class products, that the next growth area will be in biotechnology and that the manufacturing industry is showing signs of unprecedented growth. We are proud of the fact that Science & Technology has found solutions to make India a competitor in the world community in key sections of the economy. But that is not enough. The march forward cannot possibly bring succour to us until it is inclusive, until it provides solutions for the everyday problems of ordinary people. I am reminded of the famous words of Mahatma Gandhi when he said, 'The things that will destroy us are : politics without principle; pleasure without conscience; wealth without work; knowledge without character; business without morality; science without humanity; and worship without sacrifice'. I cannot but marvel at his vision.

The Green Revolution which made us self-sufficient in food has left its foot-prints. We recognize the negative impact of the over-use of fertilizers and the increasing salinity of the soil and the consequential declining productivity per capita, per acre for agricultural land. We need the gene revolution to make India self-sufficient in food. But, the gene revolution should be such that it should not bring about an environmental hazard or tinker in any fundamental manner with the ways of nature. We need preventive and/or curative solutions for the increasing incidence of those suffering from tuberculosis, malaria and HIV/AIDS. We need to work with nature, go back to it and find solutions in collaboration with nature. For every disease nature may have an antidote. We need new seeds for our farmers, which are drought resistant and pest resistant, we need bio-fertilizers to reduce the use of chemical fertilizers. We need bio-fuels to resolve our energy needs. Solar energy should cater to

some of our energy requirements. This is what I mean by collaborating with nature.

Science & Technology must also find solutions for industries which are employment oriented to make India's goods competitive in the world market. With the abolition of quotas in January 2005 technology should help in rendering our textile products more competitive for a comparative advantage. The use of technology in industry will generate employment. We need technological inputs in the sugar industry. Scientists must design their efforts to develop a new mind-set focusing on discovering new technologies for industries generating employment, for low cost yet *pucca* shelters, for curing or preventing disease, for agricultural growth and whatever it takes to make India's products competitive in the world market. In the knowledge age the scientific community, which consists of providers and seekers of knowledge must also become agents of change. Agents who can bring about intellectual competitiveness for India. Agents who can shape new economic opportunities. Agents who can enhance economic productivity. And agents who can deliver services at the doorsteps of people.

The pace of knowledge creation is very high and one is never sure when a new technology will come up to disturb all earlier planning and forecasts. Uncertainties are part of the game and one cannot wish them away. The path from conception of an idea, to research, to marketable technologies is long, tough and expensive calling for multi-disciplinary inputs from technical, financial, legal, regulatory and marketing experts and many different agencies. Risks and costs involved at the last stage of the chain in arriving at marketable technologies and products are very high. Industries have been lacking in taking such risks for many reasons. There is no room for monolithic thinking in the present scenario. Technology management is a complex issue. On an average about 25 per cent of the cost of putting a

products in the market goes towards R&D. It has been reported that the cost of putting a new drug in the market may range from \$300 million to \$1000 million. At the upper end the R&D cost may be \$250 Million which is about Rs.1100 crore.

In this context one has to realize that public private partnership will have tremendous influence on the development of technologies and how these are managed. Sharing of knowledge, costs of developing technologies and sharing of benefits emerging from utilization of technologies have become dominant factors in deciding the course of technology development. We must learn to tap the right sources of knowledge and funds. There is perhaps a shortage of venture capital firms in India who are prepared to take adequate risks in technology financing. Financial institutions like banks have to evolve suitable mechanisms for this purpose. When they can take risk on so many aspects of an industry why not for technology development? Government is one of the biggest consumers of technology. However, the present rules are not very conducive to utilization of newly developed technologies in India.

In order to address some of these issues the Government of India (GOI) has evolved many models at the national level through programme and initiatives such as Technology Development Board (TDB), Programme Aimed at Technological Self Reliance (PATSER), New Millennium Indian Technology Leadership Initiative (NMITLI) and Drugs and Pharma Programme of Ministry of Science & Technology. Full care has been taken to ensure that partners are really partners in sharing costs and rights. These are excellent examples of public private partnership. On the international front the Government has signed Intellectual Property Rights (IPR) agreement in the field of S&T with European Union (EU) and Russian Federation. There are IPR norms already operative in the Indo French Centre, which were agreed between the Indian and the French Govern-

ments. There would be a need of flexible (responsive) policies for enhancing international collaboration especially in newer areas like production of nano-powders for specific applications. India does have an edge in the high science and technology areas, which may be converted into profitable ventures. There would be a need for reasonably high level of funding for this purpose including contact research in India and abroad. Such non-wavering focus alone will lead us forward. Yet, none of this can be achieved unless we invest in human-beings.

As we all know, attracting manpower to R&D, and retaining them in a research career, has become a major challenge for us in recent times. Today, a number of schemes are being run by the Science Department of the Government to alleviate this problem supplementing the efforts of Ministry of Human Resource Development (MHRD). The Department of Science & Technology is formulating an innovative scheme, which would soon be implemented to offer continuous research support to 'performing scientists' irrespective of their employment status, affiliation and age. The idea is to guarantee working-level support to 'performing scientists' in an uninterrupted fashion based only on their track record in the preceding project. For major grants, they would, of course, go through the usual time-tested and thorough peer review mechanisms. It has been decided to name this nurture scheme as 'Ramanna Fellowships' in the memory of the noted nuclear scientist, Dr Raja Ramanna."

Shri Sibal also said "The challenges of an Information/Knowledge Society require new kinds of skills and capabilities and require new ways to obtain these skills and reinforce these capabilities on a continuing basis. The traditional Industrial Age education system was based on acquiring skills and knowledge sets in a prescribed sequential manner. The Information Age workplace is based on change and new knowledge. The degree and level of new

knowledge generation is unprecedented. New careers are emerging and almost instantaneously disappearing. The domain knowledge for traditional professions is also under constant change and revolutionary revision. The only certainty is the proliferation of new knowledge. There is clearly a need for a new system of learning, a seamless lifelong system that does not work against career changes and opportunities but rather serves the unique and ever changing educational needs of knowledge age workers. Thus, the major challenge for individuals, leaders and organizations is to constantly reinvent themselves by learning how to utilize new information to build new and relevant knowledge.”

Shri Sibal assured that in order to fulfill his commitments he will try to :

1. Bring autonomy in their functioning : for only those who are irreverent of the past in the scientific sense, will guide the future.
2. Invest in Human Resource Development and expand the skilled human resource base to meet the needs of technology for industry, academia and Research & Development Institutions.
3. Provide a suitable regulatory mechanism for an effective Bio-Technology Policy.
4. Strengthen the management system for intellectual property rights including awareness, modernization of the patent office; providing for an effective system of enforcement of such rights and helping educational institutions and small industries in protecting their intellectual property.
5. Provide for an effective public private partnership in R&D and technology-based industries.
6. Set-up National Missions in Nano-Technology, transport intelligence systems, technology development for

judicial re-engineering, eradication of malnutrition and discovery of curative and preventive medicine for malaria, HIV-AIDS and tuberculosis.

Dr.Manmohan Singh, Hon'ble Prime Minister of India, released the “Science and Technology Development of First 200 days” – A few steps to destination on this occasion.

Dr.Karsanbhai K. Patel, President, Nirma University of Science & Technology, released the Souvenir and Programme published by the Local Organising Committee to commemorate the 92nd Indian Science Congress and delivered his address.

Then, Dr. Manmohan Singh, Hon'ble Prime Minister of India presented the ISCA awards to the respective recipients as given in next page.

Prof.N.K.Ganguly, General President, ISCA in his Presidential Address, laid stress on the theme of the Congress and said “Human health is at the center of concern for sustainable social and economic progress in all the countries. There are great success stories of countries that have merged health with other developmental programs. One such example is of the Asian tigers. In the past 35 years, China, Hong Kong, Korea, Singapore, and Taiwan (China) have transformed themselves from technologically backwards and poor economies to relatively modern, affluent economies. How did these so-called Asian tigers do it? It was through reduction in infant mortality and through community education, particularly the education of the girls. I strongly believe that if you keep a girl in school you can change the course of a nation. This kicks in a cycle of late marriage, lower fertility rate, lower infant mortalities and greater economic independence. Economists agree that declining of fertility and infant mortality rates in the economically vibrant nations of Asia played a key role in creation of an educated work force and increase in public and private savings. This was then linked to an enterprising business sector and wise public investment, which changed the economic sce-

<i>Asutosh Mookerjee Memorial Award</i>	: Prof. Asis Datta
<i>C.V.Raman Birth Centenary Award</i>	: Prof. R. S. Sirohi
<i>Srinivasa Ramanujan Birth Centenary Award</i>	: Dr. Dipendra Prasad
<i>Jawaharlal Nehru Birth Centenary Award</i>	: Mr. Kapil Sibal Prof. P. N. Srivastava
<i>S.N.Bose Birth Centenary Award</i>	: Prof. R. C. Mahajan
<i>S.K.Mitra Birth Centenary Award</i>	: Prof. J. C. Bhattacharyya*
<i>Birbal Sahni Birth Centenary Award</i>	: Dr. S. K. Sopory
<i>S.S.Bhatnagar Memorial Award</i>	: Dr. P. Balaram*
<i>Vikram Sarabhai Memorial Award</i>	: Shri N. Pant
<i>D.S.Kothari Memorial Award</i>	: Prof. Samaresh Mitra
<i>Jawaharlal Nehru Prize</i>	: The Science Association of of Bengal, Kolkata
<i>The Science-in-Society Award</i>	: Dr. M. K. Bhan
<i>Excellence in Science and Technology Award</i>	: Dr. R. A. Mashelkar
<i>Prof.R.C.Mehrotra Commemoration Lecture</i>	: Dr. A. V. Rama Rao
@ <i>Nirma University President Award for Best Scientist – 2004</i>	: Prof. V. S. Ramamurthy
@ <i>ISCA General President's Award – 2004</i>	: Prof. S. S. Katiyar

*Unable to attend the inauguration.

@Presented on behalf of 92nd Indian Science Congress.

nario of these countries. It must also be remembered that at the time when economy of South-east Asia was in doldrums, the countries that had invested in primary health care technology could bring their nation back to the path of economic growth in a far better manner than the countries who did not do so.

He stated "With 16% of the worlds population, India accounts for over 20% of the world's maternal deaths. Maternal mortality ratio is still incredibly high at 408 per 100,000 live births in the country. Poor maternal health results in low birth weight and premature babies. Prof.Ganguly also stated that we have a module for home care in the case of pneumonia in children, providing antibiotics at

home and referral guidelines; a module on reduction of mortalities due to septicaemia through administration using robotics; the indigenously produced Hib vaccine to reduce Hib pneumonia, and the low osmolarity oral rehydration fluid with zinc. These interventions will reduce the number of under-six-months deaths and enhance the growth and development of children."

Prof.Ganguly stated "A major proportion of genetic disorders can be prevented by public health measures and approaches in primary public health care. Prenatal genetic diagnostic facilities identifying mutations specific to Indian population are now available in the country and will help in reducing childhood disabili-

ties. Similarly, for women, an effective injectible, long-acting contraceptive, a drug for safe medical abortion, non-injectible local drug for reduction of postpartum bleeding and a technology for effective management of anaemia are available. World-class recombinant hepatitis B vaccine is being produced in the country by several industrial houses in ample amounts and at affordable costs. A self-destructing syringe goes with this vaccine. Despite this, it has not been possible to use the vaccine due to two reasons. First, the data on transmission of hepatitis B from mother to child are scanty. Secondly, the logistics for delivering three injections of this vaccine has not been worked out in major parts of our country where 70% of the births occur at home.

India is fast developing into a vaccine-manufacturing hub. Some of the vaccines identified for development on priority include those for cholera, diarrhoea, malaria, rabies, meningitis, HIV, tuberculosis, combination vaccines, and a vaccine against cervical cancer. Two HIV vaccines were subjected to clinical trials in January 2005 as a part of international AIDS vaccine initiative.”

Prof.Ganguly pointed out that “In the drug front also, India has made advancement. We have reached the stage for developing a new drug for the treatment of tuberculosis, a new anti-diabetic, topically deliverable insulin, anti-retro-viral drug, a novel drug for psoriasis and anti-malarials. A huge battery of drugs for allergy, asthma and ulcers is being subjected to phase-I clinical trials. In India, we have good examples of community participation. One such example is that of ‘Apni Yojna’, in which a community from Churu district, Rajasthan participated in distribution, planning and management of water. It is an excellent case where government, community, consumers particularly women, and CSOs in almost 60 villages of Churu district participated. In disease control, we have achieved leprosy control, where development of new diagnostics, new treat-

ment regimes for persistors and new mapping techniques in India have brought us closer to the elimination stage of this disease. Similarly, in a complex situation of migrating population and street children, the polio control programme has incorporated state-of-the-art technology of genotyping. For the first time, India could produce a global drug, ‘Miltefosin’. This along with a companion drug, aromomycin is orally administered for treatment of kala azar and is effective against drug-resistant strains. Two new anti-malarial drugs, artemisinin derivatives—artemether and artesunate, have been marketed in the country and one more – endoperoxide, has been cleared for phase-I clinical trial. Space satellite technology is being used for mosquito control through tracking of vectors using Geographic Information Systems. In the area of textile and medicine, we have acquired the capability of making textile-based urinary bladder, and self-degrading devices, which could be used in surgery. Another achievement is the launching of the integrated disease surveillance system. Pinpointing of Chandipura virus as an emerging pathogen, by defining its role in the outbreak of acute encephalitis of unknown origin, with high fatality in children from Andhra Pradesh during 2003, underlines our capabilities”.

Prof.Ganguly said “We are in the middle of a demographic transition. The life expectancy in our country has increased from 41.2 years in 1951-61 to 62 years. This is a remarkable achievement in itself. However, this has also brought a large section of the population to an age, where life-style diseases begin to manifest themselves. Unfortunately, cardiovascular diseases are affecting our people at a much younger age. In the field of the cancer, we have a cancer mapping system which uses recent advances in computer and information technology. A peptide-based anti-cancer drug for the treatment of colorectal cancer has been synthesized indigenously and is ready for human trials. A ‘pro-drug activation’ strategy for gene therapy of

oral cancer is also being developed. A vaccine against human papilloma virus, implicated in cervical cancer, may also be introduced. After signing the Framework Convention on Tobacco Control, we will be able to circumscribe the spread of tobacco and tobacco products. Genetically modified food may likely be the answer to our problems of nutrition and micronutrient deficiencies. An area which demands immediate attention, is manufacture of medical and scientific instruments". Prof.Ganguly noted that our medical graduates have reasonably good knowledge of medical science but are often found deficient in clinical research. There is a need for critically reviewing the teaching methods in medical courses.

Prof.Ganguly also added "Financing is another important challenge. Only 20% of the science budget is allocated to CSIR, DBT, DST & ICMR together. There is a need for massive renewal of our science and technology infrastructure. The health budget is also inadequate and health research budget is meager. We need to address these issues with urgency and find solutions applicable to our setup. One solution is allocating a percentage of funds collected through sale of substances injurious to human health like tobacco and alcohol for restoration of health. Innovative methods need to be developed to differentiate between those who can pay and for those who cannot pay, for the people who are at the age group with peak levels of earning and for people who are at lowest level of earning like children and old people. Involving women in taking health related decisions at home will also lead to improvement of health. We also need to enhance the scientific freedom from the top to the grass root level and completely de-bureaucratize the scientific system. This will help in bringing out talents in our youngsters. It is important that we open up our science to the world so that we have relevant players not only in India but also have movers and shakers in global arena."

After this, the Hon'ble Prime Minister of India, Dr.Manmohan Singh, delivered his In-

augural Address. He said "This is an important gathering of our science fraternity and your annual sessions have played a historic role both in promoting research and in shaping public policy. I sincerely hope your deliberations will contribute to the fostering of scientific temper among our people. Science is not merely an instrument of economic and technological progress, it is also a means to acquiring a more rational approach to life.

Science and technology must pervade our psyche, our way of thinking and our way of working. We must have a greater integration of our economic and social programmes with R&D activists in science. The National Common Minimum Programme (CMP) of our Government underlines the importance of integrating science with society and fostering scientific temper among the people so that we are able to deal with the challenges at hand in a rational and reasonable manner.

In my very first interaction with the scientific community, at the presentation of the Shanti Swarup Bhatnagar prizes, I had made a few commitments on behalf of our government that I would like to reiterate to this larger audience.

- First, I affirm our commitment to the development of basic science, applied science and the promotion of excellence. I do not believe the issue here is of basic versus applied science. It is not an "either/or" issue. We must devote equal attention to the development of basic and applied sciences, both in teaching and research.
- Second, I committed to rebuilding the science base in universities. This will include creating synergy between new initiatives in S&T and our university system.
- Third, we will promote public private partnerships, to increase funding for frontier areas of scientific and technological research.

- Fourth, the de-bureaucratization of Science & Technology institutions will be ensured and their academic autonomy assured.
- Fifth, we will restructure our Science & Technology support systems.
- Sixth, we will create exciting career opportunities for scientists so that we can retain our talent at home. We must build more centers of excellence in science like the Indian Institute of Science. India deserves a dozen such institutions, in various fields of science.

I believe, science must also serve the needs of the weakest sections of our society. Confronted by the colossal human tragedy wreaked on thousands of people in our part of the world by the Tsunami waves triggered by an earthquake in the Andaman Sea and beyond, the question has been asked if we could have made better use of modern science and technology to alleviate, if not prevent, human suffering.

Our heart goes out to those who have suffered from the consequences of a natural disaster of this magnitude. But our scientists cannot remain silent witnesses to such natural disasters, science and technology must play a greater role in our strategy to address the problems of prevention, mitigation and management of the impact of natural disasters.

We must enhance our predictive capabilities and preparedness for meeting emergencies arising from floods, cyclones, earthquakes, droughts, landslides and avalanches. We need a better understanding of natural phenomena that lead to such disasters and of the human activities that aggravate them. Our pre-disaster preparedness is as important as our ability to mitigate and manage the post-disaster situation. I have a great expectation that the Indian Science & Technology community will rise to this challenge.

While our Government is prepared to fund the needed research and invest in the required technologies, we cannot re-invent the wheel

nor be oblivious of the fact that there are contending claims on our limited resources. If there are technologies already available we must use them, if there are systems already in place we must link ourselves with them. Where we would need investment is in promoting better utilization of existing knowledge and in disseminating this knowledge as widely as possible.

There are some other concerns about the development of science that I first wish to share with you before I turn to the theme of this year's Congress.

First, I am concerned by the fact that our best minds are not turning to science, and those who do, do not remain in science. On the one hand, we are truly proud of the fact that this year, all the nineteen young boys and girls, who represented India in Olympiads, came back with medals. On the other hand, our past record shows that practically none of such Olympiad medal winners pursued science subsequently as a career! We must reverse this trend. I understand that in a recent nation-wide study launched by Indian National Science Academy and conducted by National Council of Applied Economic Research, it was revealed that less than 3% of school children indicated their preference to pursue a career in science. We have to improve the quality of teaching and increase the enrolment of students in science and mathematics and the school level. Our scientific community must take greater interest in science and maths teaching and syllabi at school level to make them more interesting. We must find ways of making these disciplines more attractive to children and widen the base of science and maths teaching.

Second, I am concerned about the tyranny of bureaucracy and the quality of output in many of our scientific research establishments. The pursuit of research in science is an adventure, a creative endeavour. Are we creating the required environment for innovation, for experimentation, for risk and creativity in our institutions, be they universities or national

laboratories? Or have we allowed bureaucratic systems and patron-client relationships to stifle creativity?

Are our research laboratories exciting places for the young, encouraging creativity and experimentation, or are we scaring them away with our bureaucratic ways and our hierarchical systems?

Third, I do wonder whether or not we are creating the required incentive mechanisms to reward creativity? In addressing this challenge we will also be dealing with the problem of making science a more attractive career option. But there are other aspects of the incentives issue that we must also address. One such is the protection of intellectual property. I believe an important incentive mechanism for research is provided by the patent regime.

As you know, the government has taken steps to usher in a new patents regime. Apart from keeping our international commitments, an important objective of our Government is to bring in a balanced intellectual property regime, which on the one hand will give a full expression to the creative ability of India's intellectual prowess and on the other hand also protect the interest of society at large.

Indeed, an ideal regime of intellectual property rights has to strike a balance between the private incentives for innovators and the public interest of maximizing access to the fruits of innovations. This balance is reflected in article 27 of the 1948 Universal Declaration of Human Rights, which recognizes both that "Everyone has the right to the protection of the moral and material interest resulting from any scientific, literary or artistic production of which he is the author" and that "Everyone has the right to share in scientific advancement and its benefits".

I do believe that the new regime that we will have will balance the interest of the innovator and that of the society in an optimum way.

The new patents regime will have a special significance for the fortunes of our drugs and

pharmaceutical industry. Our industry benefited from the 1970 patent amendments. As a result, today we have a strong manufacturing base in drugs and pharmaceuticals. However, industry will have to move from mere imitation to innovation now. It will have to get into new drug discovery research. I am very happy that industry has already accepted this challenge. I understand that during the last four years, the R&D investment made by drugs and pharmaceutical industry has gone up by 400%. I am also happy to see the creation of new R&D centers by some of the leaders during the past few months. I assure you that our government will play an active role in partnering industry to carry this movement forward.

I would like to draw the attention of our S&T community to two areas of great importance to your economic development where the Nation can benefit from more research and innovation. These are agriculture and energy. Our Government has promised a "new deal to rural India". This "new deal" will have an economic and social content, as well as a technological component. We have emphasized the need for a Second Green Revolution. This requires greater application of S&T in agriculture. We must improve the productivity of land and water as well as of other inputs in agriculture. This requires an increase in investment, both public and private, both in rural infrastructure and in the application of S&T in agriculture. The benefits of new research in biotechnology, in electronics and communication technology and in infrastructure related technologies must translate into higher incomes for our farmers and a strengthening of our farm economy.

Biotechnology, pharmaceuticals and health technology are areas in which Indians have made impressive contributions and this is certainly a priority area for public policy.

The recent breakthrough by our scientists in the discovery of a new molecule, the first since 1963, to treat tuberculosis is an important achievement made possible by public-private

partnership in R&D. By reducing the time period for treatment of tuberculosis this molecule can help reduce the cost of treatment once it is available in the market. This is a fine example of science coming to the aid of the needy, especially the poor. Scientific advances will continue to offer new solutions for dealing with health issues. Our efforts must be to adapt such advances to our Indian conditions. Here again the importance of appropriate technology, including in instrumentation comes to the fore.

New advanced health technology must help the poor and needy. Our 'best minds' in science must engage themselves in providing solutions to the problems that can make a difference to humanity. Every thirty seconds, a child dies somewhere of malaria.

We can imagine the benefit to humanity if we had a good vaccine for malaria. HIV/AIDS is ravaging nations today. A new vaccine of HIV/AIDS can make a big difference. Such breakthroughs cannot occur unless our most creative brains dedicate themselves to these problems. I appeal to the very best of our scientific community to engage themselves in dealing with such challenges that are both intellectually stimulating and socially relevant.

New drug discovery research is becoming increasingly expensive. It now take upto 15 years and upto 1.5 billion dollars to move a molecule to the market. Let alone the poor in India, even the rich in the developed world will not be able to afford such drugs! India cannot just emulate these models and hope to win. We must create alternative paths of drug discovery, where India has distinct comparative advantage and a chance to win.

India can be a major partner in the process of discovery, development and delivery of such products.

Consider just two recent examples that encourage me to believe that our biotechnology and pharma R&D system and industry can help reduce the cost of medicines worldwide and be a force for good in the world. The Central Drug

Research Institute produced a drug to treat cerebral malaria. Themis, an Indian pharma company sells it under the brand name E-Mal to 48 countries, many of them in Sub-Saharan Africa, at affordable prices. India's Shantha Biotech came out with a recombinant DNA vaccine (Shanvac) on Hepatitis B. This vaccine was being sold for US \$ 15 per dose. Thanks to the entry of Shanvac, the price of the vaccine kept on tumbling till they came to less than a dollar per dose. Shanvac today supplies this vaccine to UNICEF for 50 cents! This is a spectacular reduction in price by a factor of thirty! India's unique S&T capacity as well as low-cost manufacturing capacity can benefit India and the whole world.

I am afraid that worldwide, we are not doing enough to fund those areas of research, which will benefit the poor. This is more so in the case of diseases of the poor. Large drugs and pharma companies will obviously work to provide the maximum value to their shareholders.

This means their research portfolio will be heavily slanted towards drugs, which bring in maximum profits to the firms and not towards the drugs for the poor. The developed countries do not have an incentive to work on diseases, which do not affect at least some part of their own population.

Countries like ours must therefore look at the diseases that affect our own populations. There is no substitute to creating new drugs for the poor excepting through public funding, both at the national and international level, and also through meaningful public private partnerships. Our Government is presently formulating programmes to launch a National Rural Healthcare Mission. I urge you to come forward with practical and relevant ideas that can help us address the needs of the people in an effective, efficient and humane manner."

Prof.B.P.Chatterjee, General Secretary (Headquarters), ISCA gave the vote of thanks on behalf of Indian Science Congress Association. The ceremony ended with National Anthem.

Plenary Sessions on the Focal Theme

The Focal Theme '**Health Technology as Fulcrum of Development for the Nation**' of the 92nd Indian Science Congress was introduced by the General President, Prof.N.K.Ganguly at the inaugural function of the 92nd Indian Science Congress on January 3, 2005.

The Plenary Sessions on the Focal Theme were held as follows :

January 3, 2005

9.45 to 11.15 a.m.

PLENARY SESSION — I

Opportunities & Capacity Building for Indian Science Cadre

Chairpersons : Kapil Sibal & M.V.S.Valiathan

Speakers	Title of the Talks
V.S.Ramamurthy	Challenges of Science & Technology Capacity Building in a Globalised Job Market
R.A.Mashelkar	Revamping Indian Science Cadre—A Vision for the Future Perspectives
Saman Habib & P.K.Das	Views by Young Scientists

11.15 to 12.30 p.m.

PLENARY SESSION – II

Indian Universities : A Vision for Achieving Excellence in Education and Research

Chairpersons : S.K.Khanna & Asis Datta

Speakers	Title of the Talks
Bruce Alberts	Excellence in Education and Research : Lessons from Universities in the United States
P.N.Srivastava	Science Education in Indian Universities

Speakers	Title of the Talks
A. Nigavekar	21 st Century & Indian Higher Education System : Issues and Challenges
Madhu Mehta	Education to Create Global Techno-Entrepreneurs : The Nirma Labs Experiment

January 4, 2005
10.00 to 11.00 a.m.

PLENARY SESSION – III

Glory of Indian Science

Chairpersons : M.R.S. Rao & Sandip Basu

Speakers	Title of the Talks
A Surolia	Back in Time and to the Future : India's Contributions for Defeating Re-emerging Infectious Diseases
G.R.Desiraju	Weak Interactions in the Chemistry Scenario in India
Rajiv Srivastava	Design and Development of 'Tejas' : The Indian Light Combat Aircraft

11.00 to 12.45 p.m.

PLENARY SESSION – IV

Could India be a Global Pharmaceutical Giant ?

Chairpersons : C.M.Gupta & S.K.Arora

Speakers	Title of the Talks
Bernard Pecoul	Can a Global Pharmaceutical Giant Ignore Neglected People ?
Bansi Lal	Role of Research in Making India a Global Pharma Giant
J.M.Khanna	Trends in Indian Pharmaceutical Industry

11.00 to 12.45 p.m.
(Parallel Session)

PLENARY SESSION – V

Environment and Health

Chairpersons : M.S.Swaminathan & S.K.Chopra

Speakers	Title of the Talks
Henry Falk	The Changing Face of Global Environmental Health
Kasturi Datta	Environment & Health—Current Scenario in India
Helmut Hahn	Tuberculosis Worldwide : The Never Ending Story
S.K.Chopra	Towards Sustainable Energy Security & Health for all in India in the 21 st Century

4.45 - 6.00 p.m.

PLENARY SESSION – VI

Using Space Technology for Societal Needs

Chairpersons : K.Kasturirangan & G.Madhavan Nair

Speakers	Title of the Talks
Lee Morin	Aspects of Space Medicine
H.P.Dikshit	Space Based Education
R.R.Navalgund	Sensing Data for Benefit to Society

4.45 - 6.00 p.m.
(Parallel Session)

PLENARY SESSION – VII

Potentials & Promises of Nanotechnology

Chairpersons : G.C.Mishra & S.K.Sarin

Speakers	Title of the Talks
Jayesh Bellare	Nanobiotechnology for Therapeutics : Some Deliberables
Jyoti Jaiswal	Potentials of Fluorescent Quantum Dot in Life Sciences

January 5, 2005

12.00 - 12.45 p.m.

PLENARY SESSION – VIII

International Research Partnerships : Outside Experience

Chairpersons : N.S.Dhalla & K.S.Reddy

Speakers	Title of the Talks
Alan Bernstein	The Canadian Institutes of Health Research : Canada's New Approach to the Organizing and Funding of Health Research
Vic Neufeld	International Health Research Partnerships : Lessons and Challenges— A Canadian Per- spective
Subroto Chatterjee	International Research Partnerships : The USA/ Singapore Connection/Experience

4.45 - 7.15 p.m.

PLENARY SESSION – IX

Innovative Water Technology for Poor

Chairpersons : Saul Arlosoroff & V.K.Verma

Speakers	Title of the Talks
Saul Arlosoroff	The Role of Technology Within the Strategy for Water Demand Management (Israel as a case study)
Y.S.Rajan	Safe Water for All – An Agenda for Action
Raj Rajaram	Case Studies of Low-Cost Wastewater Recy- cling Technologies in India
Indira Chakraborty	Impact of Water and Sanitation on Nutrition- Selected Case Studies

January 6, 2005

10.00 - 11.15 a.m.

PLENARY SESSION – X

Frontiers in Stem Cell Research and Biotherapy

Chairpersons : D.Balasubramaniam & T.C.Anand Kumar

Speakers	Title of the Talks
Mahender Rao	Characterization of Embryonic Stem Cells
V.S.Sangwan	Restoring Vision Using Limbal Stem Cell Technology
Alok Srivastava	Bone Marrow and Blood Stem Cells Novel Applications

11.15 - 1.00 p.m.

PLENARY SESSION – XI

Novel Use of IT in Science and Education

Chairpersons : Raj Shah & Joe Harford

Speakers	Title of the Talks
Vinton Cerf	Use of IT in Science in Developing Countries
Joe Harford	Use of IT in Healthcare in Developing Countries
Raj Shah	Information Technology and Communication : Over View
Robert Bollinger	Use of IT in Research in Developing Countries
A.Jhunjhunwala	Use of IT in Education in Developing Countries

4.45 - 5.45 p.m.

PLENARY SESSION – XII

Bio-Engineering Current Challenges and Expanding Opportunities

Chairpersons : C.C.Kartha & Alok Ray

Speakers	Title of the Talks
Bhuvnesh Gupta	Medical Textiles : From Wound Dressings to Tissue Engineering
G.S.Bhuvaneshwar	Medical Devices : Current Status and Challenges
S.S.Iyengar	New Applications of Distributed Sensor Networks—An Emerging Technology

January 7, 2005

9.30 - 10.00 a.m.

PLENARY SESSION – XIII

Health as a Nation Builder's Tool

Chairpersons : Barry Bloom & R.L.Mishra

Speaker	Title of the Talks
Stephen Matlin	Priority Setting for Research in Developing Countries

10.30 - 12.45 p.m.

PLENARY SESSION – XIV

Science and Society

Chairperson : Stephen Matlin

Speakers	Title of the Talks
Barry R. Bloom	Public Health Threats : Challenges and Triumphs in Asia
Sharon Hyrnkow	Global Health and Women : Perspectives from the Fogarty International Centre
Peter Singer	Genomics and Global Health
N.H.Anita	Taking Science to People

Panels

January 5, 2005

4.45 – 7.15 p.m.

PANEL - I

Scientific Challenges in Combating Malaria

Chairpersons : V.S.Chauhan & Stephen Hoffman

Speakers	Title of the Talks
Nicholas J. White	The Current Status & Strategies for Old & New Drugs for Treatment, Prevention & Control of Malaria
Stephen Hoffman	Prospects for a Malaria Vaccine
F.Kafatos	Control of Malaria in the Mosquito Vector : From Research Discoveries Towards Implementation
Anne Mills	The Cost & Benefits of Malaria Control in Africa & India
G.Padmanabhan	Malaria Research, Development and Control Strategies in India

January 6, 2005

10.00 – 11.15 a.m.

PANEL - II

High Altitude Physiology and Medicine

Chairpersons : W.Selvamurthy & P.K.Banerjee

Speakers	Title of the Talks
S.Lahiri	Function of Carotid Body at High Altitude
B.A.K.Prasad	Acute Mountain Sickness—the Indian Scenario
I.S.Anand	Subacute Mountain Sickness

11.15 – 12.45 p.m.

PANEL - III

Indian Goal in Genomics

Chairpersons : S.K.Brahmachari & M.R.S.Rao

Speakers	Title of the Talks
S.K.Brahmachari	Genomics to Systems Biology : An Overview
Rudi Balling	From Perturbation to Prediction : Tools and Needs in Infectious Diseases Research
Chetan Chitnis	Insights into Parasite Biology Using Genomics and Development of Vaccines for Malaria
Partha P Majumdar	Deciphering Genomic Architectures of Complex Diseases : The India Advantage

Public Lectures

January 3, 2005

6.00 – 7.00 p.m.

PUBLIC LECTURE - I

Chairpersons : Yash Pal & Kiran Mazumdar-Shaw

Speaker	Title of the Talks
R.A.Mashelkar	Resurgence of Innovative India

January 4, 2005

6.00 – 7.00 p.m.

PUBLIC LECTURE - II

Chairpersons : M.K.Bhan & Harsh K. Gupta

Speaker	Title of the Talks
Sam Pitroda	Indian Science in the 21 st Century

Special Lectures

January 3, 2005

8.45 – 9.45 a.m.

SPECIAL LECTURE - I

Chairpersons : N.K.Ganguly & M.K.Bhan

Speaker	Title of the Talks
C.N.R.Rao	Science & Our Future : Personal Reflections on Doing Science in India

January 4, 2005

9.00 – 10.00 a.m.

SPECIAL LECTURE - II

Chairpersons : Mangla Rai & Asis Datta

Speaker	Title of the Talks
M.S.Swaminathan	Mission 2007 : A Hunger Free India & Every Village a Knowledge Centre

January 5, 2005

11.30 – 12.00 noon

SPECIAL LECTURE - III

Chairpersons : P.K.Hota & M.K.Bhan

Speaker	Title of the Talks
Richard D. Klausner	Global Health – The 21 st Century Challenge for Science, Technology and Society

January 6, 2005

9.00 – 10.00 a.m.

SPECIAL LECTURE - IV

Chairpersons : Amit Ghosh & Jacob John

Speaker	Title of the Talks
Rita Colwell	Cholera—Epidemiology, Genetics and Vaccine Development

4.45 – 5.25 p.m.

SPECIAL LECTURE - V

Chairperson : P.R.Narayanan

Speaker	Title of the Talks
P.H.Lagrange	The Key Role of a “tool box of diagnosis” for the Management of Tuberculosis in Endemic Country

January 7, 2005

9.00 – 9.30 a.m.

SPECIAL LECTURE - VI

Chairpersons : Barry Bloom & R.L.Mishra

Speaker	Title of the Talks
Samlee Pilangbangchang	Role of Public Health in Boosting National Economies

10.00 – 10.30 a.m.

SPECIAL LECTURE - VII

Chairperson : Samlee Pilangbangchang

Speaker	Title of the Talks
C.P.Thakur	Disease Elimination : The Kala-azar Experience

Award Lecture

January 6, 2005

5.45 – 7.00 p.m.

TWENTY-FIFTH G.P.CHATTERJEE MEMORIAL AWARD LECTURE

Speaker	Title of the Talk
Prof.(Mrs.) Kasturi Datta	- - -

Health Science Summit Programm

(Parallel)

January 6, 2005

10.00 – 10.45 a.m.

Special Lecture

Chairpersons : S.Habayeb & N.K.Ganguly

Speaker	Title of the Talks
Altaf Lal	Making Health a National Priority

10.45 – 11.30 a.m.

Session – I

Curtailling the Menace of Infectious Diseases

Chairpersons : Jacob John & R. C. Mahajan

Speakers	Title of the Talks
Ali S.Khan	Emergency Public Health Preparedness
A.C.Mishra	Emergence of Chandipura Encephalitis in India
J.P.Narain	Managing Emerging Infectious Diseases in Asia

11.30 — 1.15 p.m.

Session – II

HIV/AIDS & TB : Needs and Challenges in Research

Chairpersons : Jack Whitescarver & S. Y. Quraishi

Speakers	Title of the Talks
P.R.Narayanan	DOTS Strategy and Multi Drug Resistance TB
Prabhat Jha	HIV-1 in India: Determinants and Trends
Renu Lal	Molecular Epidemiology of HIV/AIDS Virus
Margaret Johnston	A Bumpy Road to HIV/AIDS Vaccines

2.00 – 4.00 p.m.

Session – III

Responding to the Challenges of Chronic Adult Diseases

Chairpersons : S. P. Agarwal & K. K. Talwar

Speakers	Title of the Talks
Paresh Dandona	Obesity, Diabetes and Atherosclerosis : A Global Challenge
V.Mohan	The Diabetes Epidemic in India is it Due to Genetics or Environment?
Salim Yusuf	Tackling the Global Epidemic of Cardiovascular Diseases
John Frank	Biopsychosocial Determinants of Health Status at the Population Levels
Harish C. Pant	Mechanisms of Topographic Regulation of Neuronal Cytoskeleton Proteins in Brain during Neuro-degeneration
Bruce McManus	The Remaining Enigmas of Human Heart Valva Diseases

4.00 p.m. – 4.45 p.m.

Session – IV

Disease Control and Elimination with Existing Tools

Chairpersons : Altaf Lal & Sharon Hrynkow

Speakers	Title of the Talks
Bruce Alyward	Global Polio Eradication : Success and Challenges
I.C.Verma	Control of Genetic Disorders in India
J.H.Maguire	Elimination of Parasitic Diseases

4.45 p.m. – 5.30 p.m.

Session – V

Immunology in Medicine

Chairpersons : G. P. Talwar & N. K. Mehra

Speakers	Title of the Talks
Baghirath Singh	Advances in Pathogenesis of Autoimmune Disorders
Sudhir Gupta	Conquering Cancer through Immunological Approaches : A Crystal Ball for the Future

5.30 – 7.00 p.m.

Special Lectures

Chairpersons : G. B. Nair & Vijay Chaudhary

Speakers	Title of the Talks
G.S. Chhatwal	Rheumatic Fever Paradigm : Diagnostic Implications
Henry Gabelnick	Prospects for Microbicides
Alain Merieux	The Key Role of in-vitro Diagnostics in Health Managed Care, Specially in Strained Resource Countries
Y.Takeda	Can we Eradicate Cholera?

ADDRESS AT THE 92ND INDIAN SCIENCE CONGRESS

by
Dr. A. P. J. Abdul Kalam
Hon'ble President of India
on January 5, 2005

What can be the mission for the Scientists?

Friends, since this Science Congress focuses health technology as fulcrum of development, I am starting with thoughts on Pharma and healthcare.

In the year 2004, I have visited five R&D laboratories of Pharma Industries and three health centres and also I have addressed seven medical conferences on Ophthalmology, Cardiology, Liver diseases, Allergic diseases, Vascular surgery, general surgery, atherosclerosis and thrombosis and Pharma vision 2020. I was very happy to see the economic strength of the Pharma industry resulting from the technological innovation of their R&D laboratories. In the year 2000 there was a fear among the members of the health sector and scientists that they will not be able to compete in the international market due to WTO environment. When I now visited these Pharma units, I find the situation is totally changed. The confidence of the Pharma community is coming in a big way due to the establishment of state-of-the-art R&D labs. During my visit I discussed with the scientists, technologists and I am completely convinced that Indian Pharma sector is becoming very robust with a sound research and development base. Even though they have developed hundreds of molecules, the way the scientific and laboratory experiments are progressing, I am convinced that at least three major molecules will transform into drugs very soon.

Now I would like to give my visualization of developed India in 2020 and the mission of scientific community.

Developed India in 2020

1. A Nation where the rural and urban divide has reduced to a thin line.
2. A Nation where there is an equitable distribution of energy, quality water and access to quality electric power.
3. A Nation where agriculture, industry and service sector work together in symphony, absorbing technology thereby resulting in sustained wealth generation leading to higher employment potential.
4. A Nation where education is not denied to any meritorious candidates because of societal or economic discrimination.
5. A Nation which is the best destination for the most talented scholars and scientists all over the world.
6. A Nation where the best of health care is available to all the billion population and the communicable diseases like AIDS/TB, water and vector borne diseases, Cardiac diseases and Cancer are extinct.
7. A Nation where the governance uses the best of the technologies to be responsive, transparent, easily accessible and simple in rules, thereby corruption free.
8. A Nation where poverty has been totally alleviated, illiteracy and crime against women are eradicated and the society is unalienated.
9. A Nation that is prosperous, healthy, secure, peaceful and happy.
10. A Nation that is one of the best places to live in, on the earth and brings smiles on a billion plus faces.

These are the ten dimensional transformations needed for competitive India and we have to work for it. Towards this end I would like to share thoughts on expected important achievements in Science and Technology in 2005.

2005 Science progress

I have visited number of science and technology laboratories and also had the opportunity to interact with the scientific and technological communities. My assessment is: five important S&T areas will influence Indian society in healthcare, education, employment generation and defence during 2005.

Stem cell research

Many Indian laboratories and hospitals are working in Research and Development of Stem Cell growth. Advancement in stem cell research in the country has brought confidence among expert doctors to take up its clinical application in heart, eye, pancreas, liver, neural, kidney diseases and spinal injury. Drawing of tens of thousands of stem cells, which are capable of transforming themselves into almost any kind of tissues from the suffering patients and injecting them into the heart to stimulate heart restoration has already been practiced. This increases the pumping efficiency from 25% to 40% over a period of four months. The recent identification and characterization of progenitors with stem cell properties has opened new avenues that will be useful for treating functional impairments caused by the death of specific cell population in the eye region. The stem cells also help restoration of vision in patients who have these diseases, by repopulating the damaged ocular surface cells or retinal cells from further degeneration. Many healthcare institutions in India are working in stem cell area and have successfully treated heart patients and eye patients. Recently a patient with spinal cord injuries has been suc-

cessfully treated with stem cells from umbilical cord blood in South Korea and it could signal a leap forward in the treatment of spinal cord injuries. Definitely we will see wide spread stem cell research and its application to treatment of many diseases in a cost effective way.

Interactive Tele-education delivery system

Availability of quality education for remote areas requires tele-education as a vital tool. ISRO's EDUSAT (Educational Satellite) programme is designed to provide support to education through low-cost ground segments and to reach the un-reached people of India. The satellite is specially configured to have multiple beams covering different regions of India, through five regional beams and a national beam.

This system will be useful for school, college higher level of education; and non-formal education. The EDUSAT, when fully operational will have a capacity of 30 uplinks and about 5000 remote terminals per uplink. EDUSAT is expected to provide one-lakh fifty thousand ground terminals in its full capacity. EDUSAT is not only a Receive Only Terminal system; it works on an IP protocol and brings both way interactivity and collaboration. EDUSAT coupled with the Broadband through Fiber, wireless broadband will form a heterogeneous network in taking the quality education to all parts of the country. For example, a mathematics teacher takes a class at Bhimavaram, Andhra Pradesh, it is beamed to EDUSAT satellite in real time and the students in the class rooms at Samastipur in Bihar will see the teacher and hear the lessons. Hence a good teacher teaching anywhere in the country in any language can be heard, seen and interacted with through the implementation of interactive tele-education delivery system over the EDUSAT, broadband and Wireless communication channels.

Bio-fuel - Jatropha

Use of Bio-fuel will increase many fold. Bio-fuel plant farming, harvesting, extraction and esterification process will provide large employment opportunities apart from bringing down the import of crude oil. *Jatropha curcas* is bio-fuel plant and it can grow well in dry land with very little water input. Once grown the crop has fifty years of life. Fruiting can take place in this plant from six months to three years. It yields up to five tonnes per hectares of oil seeds which can produce two tones of bio-diesel. Bio-diesel plants grown in eleven million hectares of land can yield a revenue of approximately Rs.20,000 crore a year and provide employment to over eleven million people both for plantation, running of the extraction plants and trans-esterification. Use of Bio-diesel is CO₂ emission free. This oil can also be used for soap and candle industries. It gives the by-product called Glycerin, which is used in Pharma industry. De-oiled cake is a raw material for composting and plantation is good for honey production. *Jatropha* saplings can be multiplied through Tissue culture and further research is required on hybrid varieties for increasing the oil content of seeds and drought resistant characteristics of the plant. Presently, the indigenously designed bio-fuel plant for 250 ltr/day is in operation. We have to design and develop bio-fuel plants of 3 to 10 tonnes per day capacity for installation in different parts of the country. Effective marketing chain need to be planned for enabling farmers to reap the benefits directly. Bio-fuel mission will provide technological and employment generation focuses for the rural sector. Use of eleven million hectares of waste land for *Jatropha* cultivation can lead to generation of minimum twelve million jobs.

Brahmos: Supersonic cruise missile

The Indo-Russian joint venture has developed the supersonic cruise missile, the first of its kind in the world scene. It is a remarkable achievement for both countries. It is a force multiplier for defence forces. It is a universal missile flying at the speed of Mach 3 for multiplatform configuration by variety of trajectories against multiple targets. It is an opportunity for India and Russia to go in a big way to produce competitively and market the Brahmos to suitable countries.

Molecules to drug

This year I have visited number of Pharma R&D Centres. There is a great movement in transforming molecules to drug, I feel in 2005, at least three drugs will materialize leading to the treatment of certain type of cancer and the other for diabetes and inflammatory diseases. In addition to the above scientists have to take note of the progress made in Nano-Science and Nano-technology and participate in research and product development to make India a leading player and become an exporter of nano-technology products

Technology through Ages

Through out the last 120 centuries, unique cultures have come into existence due to advancement in technology. The first 118 centuries had a dominance of primarily stone, bronze & iron ages. The last two centuries have seen rapid development of chemical age. The advancements made in material science and technology gave the impetus for both nuclear and biological age to flourish. Succession of these technology periods has involved progression from simpler materials to more complex forms of science and engineering. We are today at the

convergence of Nano, Bio and Information technologies. This age, I feel will create historical revolution and we must be at driver's seat to contribute towards this societal change.

When I think of Nano-science and Nano-technology, I am reminded of two personalities. First person is Richard Feynman, who described the concept of 'building machines' atom by atom in his talk at Caltech titled "There is plenty of room at the bottom". The second person is Eric Drexler, who wrote the book titled 'Nano Systems, Molecular Machinery, Manufacturing and Computation'.

Since independence, the country had all along been taking recourse to technology for societal changes and economic prosperity. A nation that is alert should be sensitive to the changes that take place to the technological fabric of the world and prepare itself for the arrival of newer changes in the horizon.

We believe that nano-technology would give us an opportunity, if we take an appropriate and timely action, we can become one of the important technological nations in the world.

Applications

The world market in 2004 is for nano materials, nano tools, nano devices and nano biotechnology put together is over hundred billion dollars. It has been noticed that the fastest growing area among these is nano-biotechnology.

Carbon nano tubes and its composites will give rise to super strong, smart and intelligent structures in the field of material science. Nano-Biomedical sensors will play a major role in glucose detection and endoscopic implants. Drug delivery system will revolutionize the health-care to a large extent.

Molecular switches and circuits along with nano cell will pave the way for the next generation computers. Ultra dense computer memory coupled with excellent electrical performance will give the society low power, low cost, nano size and yet faster assemblies.

The last four decades have also affected the packaging concept. Electronics packaging of the past has given way to the present Microsystems packaging and the shift in the trend is now towards the futuristic nano packaging.

Treatment of Parkinson's disease

Recently I met Prof. Vijay K Varadan of Pennsylvania State University, US. He shared his experience on the possible line of treatment for Parkinson's disease and Epilepsy. The primary symptoms in Parkinson disease as you all aware are tremor or trembling in hands, arms, legs, jaw, and face, rigidity or stiffness of the limbs, slowness of movement and impaired balance. Prof Varadan has devised a wireless system for monitoring and control of Parkinson's disease. The system consists of an implantable DNA insert in the head region for generating a pulse to the nerve system; controlled either by a modified pacemaker or smart hat. A Passive polymer based gyro sensor, which is implanted in the tremor location. The sensor gets the power from the Pacemaker and the Pacemaker then reads the tremor motion. The Pacemaker then generates the pulse in the implanted device in the head to control the tremor. This appears to be a promising line of treatment for such diseases. Prof. Varadan also has reported that the few patients affected by Parkinson diseases had a full recovery.

Solar Energy

CNT (Carbon Nano Tubes) based Photo-

voltaic Cell: Presently silicon based photo-voltaic cell have only an efficiency of 13 to 15%. This has become a big challenge for converting solar energy into power. Research has shown promise of increasing the efficiency of the photo-voltaic cell to 40 to 50% using CNT. This will enable us to have highly efficient 100 MW solar energy plants in different regions of the country which will have virtually zero recurring cost.

Shock embedded Tidal Wave (Tsunami)

As you are aware, the coastal region of our country faced a severe calamity due to shock embedded tidal wave, which will need an innovative package for reconstruction of homes of the affected population.

The scientists present here, have to ask yourself, what you can do in such a situation for bringing relief to the people and also what science can do to prevent such devastating occurrences in future. They can definitely contribute in the areas of prediction of earthquake on land and seabed.

Prediction research

The Seismologists have put most of their efforts in studying seismic variations and patterns of foreshocks and aftershocks. In certain countries, earthquakes have been successfully predicted using a noticeable increase in background seismic activities. If foreshocks can be recognized early, giving a timely warning can save lives of many people. The stages of a rising seismic activity include, building up of elastic strain along a fault, development of cracks, increase in stress, decrease in electrical resistivity etc. This theoretical series of events could eventually lead to a way to predict the occurrence of major earthquakes. The events are still theoretical and need much more data

to make them useful enough for practical applications.

Science, Technology and Society

Technology is the non-linear tool available to humanity which can affect fundamental changes in the ground rules of economic competitiveness. Science is linked to technology through applications. Technology is linked to economy and environment through manufacture. Economy and environment linked to technology promotes prosperity to the society.

The scientists and technologists whatever work or mission they do always they have to ask the question, any part of my scientific work will it have a positive impact on meeting the human needs.

Now I would like to discuss about the challenges that the nation has to overcome and certain missions which are required to be implemented to transform India into a developed nation by the year 2020.

The Mission of PURA

The number of PURA units for the whole country is estimated to be 7000. This envisages integrated connectivities to bring prosperity to rural India. These are—physical connectivity of the village clusters through quality roads and transport; electronic connectivity through telecommunication with high bandwidth fiber optic cables reaching the rural areas from urban cities and through Internet kiosks; and knowledge connectivity through education, vocational training for farmers, artisans and craftsmen and entrepreneurship programmes. These three connectives will lead to economic connectivity through starting of enterprises with the help of banks, micro credits and marketing of the products.

Each PURA cluster will connect about 20-30 villages depending upon the region and population and will cost about Rs.100 crores. This is a viable and sustainable business proposition. After initial short-term employment during construction etc., we have to plan for initiating actions for providing regular employment and self employment opportunities in nationally competitive small enterprises in agro processing, manufacturing and services sectors for about 3000 people. If the industrial/business parks are marketed well, they can generate employment opportunities in support and services sector for about 10000 people. This will provide sustainable economy for the rural sector. In this national mission, bankers can promote entrepreneurship in the rural areas. This will lead to the removal of urban-rural divide.

PURA as an Enterprise

A large number of banks have entrepreneurial development programmes. Banks have also been funding Small Scale Industries of different types in various regions. The small scale industrialist is a promising candidate for becoming the chief executive for managing the PURA complexes in an integrated way. PURA enterprises can also undertake management of schools, health care units, vocational training centres, chilling plants, silos and building a market, banking system and the regional business or industrial units. A new mission mode management style has to emerge for PURA enterprises. It should not be looking for protective legislations to support them. Rather they should be efficient to compete with others. This new PURA enterprise needs partnership from the bank, from the Government and also from the private entrepreneurs. Banks can train the entrepreneur for managing the PURA in their training centres and also provide them loans for

creating and running PURAs as a business proposition.

I would like to talk to you the experiences of our three well known scientists.

Dr. D. S. Kothari

Dr. D. S. Kothari, a Professor in Delhi University was an outstanding Physicist and also an Astrophysicist. He is well known for ionization of matter by pressure in cold compact objects like planets. This theory is complementary to thermal ionization work done by Dr. Meghnad Saha his guru. When he became the Scientific Adviser to Defence Minister he established the Defence Science Centre which became the nuclei for generation of products and systems required by the Armed Forces.

Dr. Homi Jehangir Bhabha

Dr. Homi Jehangir Bhabha carried out research relating to cosmic radiation. In 1939, he joined Sir CV Raman in IISc Bangalore. Later, he was asked to start Tata Institute of Fundamental Research with focus on nuclear science, mathematical science and established Atomic Energy Commission in 1948. Multi centers were born as part of BARC with his vision in nuclear science to nuclear technology, nuclear power, nuclear devices and nuclear medicine.

Prof. Vikram Sarabhai

Prof Vikram Sarabhai the youngest of the three and worked with Sir CV Raman in experimental cosmic ray. Prof Sarabhai established Physical Research Laboratory in Ahmedabad with Space research as focus. In later years he become the Director of Space S&T Centre. The SSTC (1963) started with launching sounding rockets for space atmospheric research. Prof. Vikram Sarabhai unfurled the space mission for India in 1970

that we should build Satellite Launch Vehicle capability, to put our communication satellites in the geo-synchronous orbit and remote sensing satellites in the polar orbit. Also, he envisaged that launch vehicles built in India should be launched from Indian soil. This one visionary thought led to intensive research in multiple fields of science and space technology. Many of us had the fortune to be part of Prof. Vikram Sarabhai's vision. Today, India has the capability to build any type of satellite and launch it from its soil.

Conclusion

These three Indian scientists, all of them physicists, started physics research institutions that blossomed into defence technology, nuclear technology and space technology. When I study deep into their knowledge and the vision, I believe they would have realized that science has to be promoted through political systems. It is essential that technologies that give immediate benefits to the people directly or indirectly should be successfully put forward. The

three great institutions have emerged with 20000 scientists spread in institutions all over the country. Another important message conveyed by these three great scientists is that basic science is very vital for growth of technology and growth of scientific and technological human resource and thereby transforming the society.

Particularly for young scientists who have assembled here, I am giving these role models, so that when you are doing scientific research you always ask yourself, "Can my research and development task contribute to the upliftment of the people of my country". It may be any area of research: medical science, physics, chemistry, space research, nuclear research, defence research, mathematical science, earth sciences etc. Particularly for developing country like ours which has a vision for a developed nation, your contribution in the scientific field is all the more important.

My New Year greetings and best wishes to all of you. May God bless you.

Activities in Sections

Deliberations in different sections commenced with the addresses of Sectional Presidents (Annexure - II) followed by Platinum Jubilee Lectures (Annexure - III) in each section. Symposia on specialised topics (Annexure - IV) and a large number of Invited/Special Lectures (Annexure - V) were organised by the sections during the Session, which formed an integral part of the technical programme of the Science Congress.

ISCA Young Scientists' Programme

Presentation of papers under ISCA Young Scientists' Programme in sections were arranged on January 5, 2005. This year twenty four young scientists received award under this

programme. Names of those young scientists and titles of their papers are given in Annexure - VI.

Presentation of Contributed Papers (Poster/Oral)

Most of the contributed papers accepted on the basis of screening done by the Sectional Presidents were presented by way of Posters during January 5-7, 2005. The names judged for best poster presenter during the 92nd Indian Science Congress—2005 in different sections are given in Annexure - VII. Oral presentations of some selected contributed papers were also made in different sections.

ISCA Endowment Lectures

Following ISCA Endowment Lectures were delivered during the 92nd Indian Science Congress in different Sections :

Name of the Award	Speaker	Title
Prof. Hira Lal Chakravarty Award (Section of Plant Sciences)	Dr. Manoj K. Dhar, Jammu	Plantago : Botany to Biotechnology Bioinformatics : Past, Present & Future
Pran Vohra Award (Section of Agriculture and Forestry Sciences)	Dr. Supriya Chakraborty Varanasi	Biological and Mole- cular Characterization of Tomato leaf curl Gujarat virus, a new Species of Begomo- virus from India
Dr.B.C.Deb Memorial Award for Soil/ Physical Chemistry (Section of Chemical Sciences)	Dr. Subhendu Adhikari, Bhubaneswar	Micronutrients and Aquaculture
Prof. R. C. Shah Memorial Lecture (Section of Chemical Sciences)	1. Dr. Arindam Banerjee, Kolkata	Synthetic Self Assembling Peptides in Biology and Material Sciences
	2. Dr. V. R. Pedireddi, Pune	Non Covalent Synthesis : A Novel Approach Towards the Synthesis of Functional Bioactive Solids
Prof.(Mrs.) Anima Sen Memorial Lecture (Section of Anthropological and Behavioural Sciences including Archaeology and Psychology & Educational Sciences)	Prof. (Mrs.) S. P. Sinha, Agra	Residential Crowding Stress Among Elderly
Dr.(Mrs.) Gouri Ganguly Memorial Award for Young Scientist in Animal Science (Section of Animal, Veterinary and Fishery Sciences)	Dr. D. Nagalakshmi, Hyderabad	Feeding Strategies to Enhance the Annual Productivity in Fodder Scarce Situation

Session on Science for School Children

A focused programme on **Children Science Congress** was organised during the 92nd Indian Science Congress to encourage talented and highly motivated budding scientists. About 350 selected students and their teachers attended the session and enjoyed the activity. To make this interaction more creative and meaningful, the 32nd State Science and Mathematics Exhibition was also organized at Science City by the Gujarat Council of Educational Research and Training during this period. About 800 students along with 1500 guide teachers from primary, secondary and higher secondary schools from different districts of Gujarat displayed their exhibitions on the theme 'Recent trends in science and technology'. The event provided a good platform for students and teachers of the state to interact with national-level students as well as other scientists and professionals.

In his inaugural keynote address, Prof. Yashpal said that it was sad that education imparted in our schools and colleges and our experiences in life do not match. He said that education, that needs coaching classes, is reduced to cramming information without knowledge and understanding. Once we develop the habit of understanding things, we would no longer blindly accept facts and information and would thus develop a scientific attitude, he said. In his inaugural address, Narendra Modi, Chief Minister of Gujarat, stressed on the need for developing a scientific temper and also an atmosphere where science and scientists become a source of inspiration for people to take up science as a profession. In his opinion, people can recognize artists but not scientists, who have dedicated their lives in search of new innovations for societal development. It is the

endeavour of organizations like Science City to popularize science.

On the second day, Ravindra Keshkar and Jayant Dharmsey gave a lesson in mathematics that showed science and mathematics also can be learnt by origami, a game involving folding of a paper. Ashutosh Rawal explained that Vedic mathematics could be a handy tool for those who need to solve mathematical problems faster by the day, especially in a system where the emphasis is on examinations. There was a two-hour session, when students interacted with Yashpal on various subjects. This was followed by an interactive workshop on model rocketry, coordinated by the Vikram Sarabhai Community Science Centre. It gave immense thrill to the children, who rarely get opportunities to scientifically experiment with rockets.

The third day was memorable one for all the student delegates as well as their teachers. The day was reserved for close interaction with the President of India, Dr. A.P.J. Abdul Kalam. The curiosity of the children knew no bounds when the President declared the question-answer session open. This resulted in a flood of questions from mundane to serious ones. And, Dr. Kalam answered them all with patience and ease.

Some of the questions asked were : Why didn't America warn Indonesia about the tsunami threat when they knew about it several hours ago? What is the difference between the air-to-air and surface-to-air missiles? Why has an Indian not landed on the moon yet? Why does the reservation quota exist?

Dr. Kalam told students about the importance of being properly educated, about natural

disasters and measures to be taken when they strike.

When asked why America did not warn Indonesia of tsunami, Dr.Kalam said, 'they detected the danger about six hours in advance. I saw it on a website. If they had alerted Indonesia, the loss of lives may not have been so great. May be their system of warning covers the Pacific states, while the incident occurred in Sumatra'. He added, 'an earthquake is difficult to predict, but tsunami can be detected as they travel at a spread of 800-1000 km per hour'. He also backed the idea of setting up a tsunami-warning system, which can be connected to the database in the Pacific region, so that data exchange can be fast and easy. Dr.Kalam also emphasized on including a chapter on tsunami in school textbooks, so that children can learn how these waves are generated and what is the reason behind the phenomenon.

Telling children that everything is possible, Dr.Kalam gave the example of a bumble-bee. 'Technically, if you look at the bumble-bee, it is not build for flying. It does not posses the kind of wings that will help it to fly. Yet, it manages to fly'. The President asked the students to have a goal, and then work hard towards achieving it. He told them to keep experimenting, and also to respect their teachers.

The fourth day was reserved for trekking. The delegates visited the Vikram Sarabhai Community Science Centre. Activities depicting basic principles of physics, chemistry, mathematics and biology awaited them, followed by a couple of interactive games like web of life, who am I, etc. Students and their guide teachers then visited the Space Application Centre (ISRO), Ahmedabad. The afternoon session once again gave them an opportunity to meet and interact with several eminent scientists.

On the fifth day, the delegates were taken for another field trip to Bhaskaracharya Institute for Space Applications and Geo-informatics, Gandhinagar where they could explore application of remote sensing satellites and Geographic Information System for developmental and planning activities in agriculture, land and water resource management, watershed development, forestry, disaster management, infrastructure and educational activities.

The students then visited Indroda Nature Park, being developed by Gujarat Ecological Education and Research Foundation. During the nature walk, they visited the Dinosaur park, aviary, crocodile park, deer park, botanical garden, etc. and also interacted with the scientists at these centres. In the afternoon, the students were back at the venue of Science Congress for the valedictory function. Prior to that they attended the Vigyan Jatha activities conducted by Regional Community Science Centre, Rajkot.

The entire event in the sprawling, undulating landscape of the Science City offered these budding scientists a rare opportunity of exploring the wonder world of science and technology. Along with showcasing their exhibits, the student delegates interacted with other students, experienced the thrill of watching "T-Rex : Back to Cretaceous", an IMAX 3D movie and walked through different theme pavilions of the Gujarat Science City. 'It was wonderful experience and a dream place', many of them quoted while leaving the Science City campus.

The activities during the Children Science Congress were also witnessed by thousands of other students who were visitors to the Gujarat Science City. The Science City had also arranged for the live telecast of specific events on its newly installed large LED screen for mass-viewing.

Science Expo – Pride of India Exhibition

Shri Kapil Sibal, Hon'ble Minister for Science & Technology, Government of India, inaugurated the Pride of India exhibition on the sidelines of the Congress. The exhibition had a special section called "Hall of Pride", dedicated to the two sculptors of our nation—the nuclear scientist, Prof. Raja Ramanna and the industrialist, Kasturbhai Lalbhai. The 'Pride of India Expo' included more than 80 participants from various R & D laboratories, major corporates, state and central government insti-

tutions and departments, amongst others took part in the exhibition.

The Indian Council of Medical Research depicting achievements and activities of its institutes, put up the largest pavilion in the Pride of India Expo. As the host of the Congress, the National Institute of Occupational Health has a pavilion, showcasing its range of activities. The expo got an overwhelming response from the public and around two lakh people visited the exhibition.

Participation of Foreign Scientists

Representatives of some foreign scientific societies/academies and a few individual scien-

tists from abroad participated in the various deliberations in the 92nd Indian Science Congress.

Valedictory Session

The Valedictory Session of the 92nd Indian Science Congress was held on January 7, 2005 at 6.00 p.m. at the Main Pandal, Nirma University of Science & Technology.

Mr. D. P. Chhaya, Executive Registrar of Nirma University of Science & Technology welcomed the dignitaries, scientists and members of the ISCA.

Dr. H. N. Saiyed and Dr. Pankaj Shah, Local Secretaries delivered their addresses on this occasion.

Prof. N. K. Ganguly, General President, 92nd Indian Science Congress presented twentyfour ISCA Young Scientist Awards (Certificate and Rs.5,000/- in Cash) in recognition of their contributions in respective areas of researches. Awardees were introduced by Prof. S. P. Singh, General Secretary (Outstation).

The Chief Guest Prof.N.M.Vasani, Vice-Chancellor of Nirma University of Science & Technology distributed twentyeight Best Poster

Awards (Rs.1000/- in Cash along with a Certificate) to the participants judged as best poster presenters in sections respectively during the 92nd Indian Science Congress.

Prof. N. K. Ganguly, General President, 92nd Indian Science Congress delivered an address on this occasion.

Dr. I. V. Subba Rao, General President-Elect, gave a brief introduction of the Focal Theme "Integrated Rural Development : Science and Technology" of the 93rd Indian Science Congress.

Mr. Hiren Bhai Patel, Organizer, 92nd Indian Science Congress delivered an address.

Prof. N. M. Vasani, Vice-Chancellor, Nirma University of Science & Technology, delivered Chief Patron's Address on this occasion.

Prof. H. V. Trivedi, Local Secretary, offered a hearty vote of thanks to the participants of the 92nd Indian Science Congress.

Recommendations of the Focal Theme “Health Technology as Fulcrum of Development for the Nation” of the 92nd Indian Science Congress

Science and Technology Policy

1. In order to see India as a prosperous, healthy, secure, powerful and happy nation, a greater emphasis must be placed on the science and technology policy.
2. In the long term science has to come to our rescue for understanding the designs of nature, foretelling them and devising methods for reducing the damage and post disaster management, even if the investments required are high.
3. The scientific community must move away from trodden path onto a new road to discovery and invention through the use of technologies in collaboration with nature for the good of humanity.
4. Science must provide acceptable solutions for everyday problems of the common man. The development of newer indigenous technology will help create jobs, capital and wealth for the poor.
5. Science & Technology must find solutions for industries, which are employment oriented to make Indian goods competitive in the world market.
6. Scientists must design their efforts to develop a new mind-set focusing on discovering new technologies for industries generating employment, for low cost yet pucca shelters, for curing or preventing disease, for agricultural growth and whatever it takes to make India's products competitive in the world market.
7. In the knowledge age the scientific community that consists of providers and seekers of knowledge must become agents of change; agents who can bring about intellectual competitiveness and new economic opportunities for India.
8. The public-private partnerships will have tremendous influence on the development of technologies and how these are managed. There is a need for high level of funding for research, including contract research.
9. The domain knowledge for traditional professions is under constant change and revolutionary revision. There is a need for a new system of learning to serve the ever-changing educational needs of knowledge age workers.
10. Only 20% of the science budget is allocated to CSIR, DBT, DST & ICMR together. There is a need for massive renewal of our science and technology infrastructure. The health budget is also inadequate and health research budget is meager. We need to address these issues with urgency and find solutions applicable to our setup. One solution is allocating a percentage of funds collected through sale of substances injurious to human health like tobacco and alcohol for restoration of health.
11. We can open up our science to the world so that we have relevant players not only in India but also have in global arena.
12. In India, a large number of scientific organizations generate data, which are of paramount importance. The 92nd Science Congress recognizes the importance of creating national databases, which can be used by one and all to submit their observations to a central location.
13. Restructure science and technology support systems as well as debureaucratize science and technology policy implementation.

Health Technology

14. Health plays a vital role in development, not only an outcome, but a co-determinant. Enhancement of investment in health is necessary to yield exceptionally high rates of return.
15. There is a need to develop technologies for achieving our millennium goals of reduction of infant mortality rate and reduction of maternal mortality.
16. Strengthening of policy for education of girl child will break a cycle of late marriage, lower fertility rate, lower infant mortalities and greater economic independence of women.
17. It is absolutely necessary to translate the Indian health research system data into preventive and intervention health strategies for the country. We now need to create a National Health Research Forum, and integrate with the National Health system to provide guidance.
18. Immediate attention is required in the manufacturing of medical and scientific instruments in our country, so that we become the leading suppliers of the instruments in the world market.
19. There is a need to strengthen and develop appropriate animal facilities for health research, for drug development, etc.
20. Innovative methods need to be developed to differentiate between those who can pay for health care and for those who cannot pay, for the people who are at the age group with peak levels of earning and for people who are at lowest level of earning like children and old people.
21. A strong public health care system, supported by education and awareness, is required to reduce the disease load and the burden on health services, to enhance productivity and catalyze a vibrant

economy. It is recommended for more investment on public health, building up health care systems and infrastructure, enhancing access to effective health interventions for poor and vulnerable groups, etc.

Agriculture and Food Policy

22. Science & Technology must provide answers for the undernourished and the illiterate. Fortifying the crops is a realistic and achievable breakthrough. This ensures that chronically undernourished segment of the population derives micronutrient supplementation from the staple diet and even with little variety in the food, and thereby nourishment status is improved.
23. Implement nutrition safety net schemes in an integrated manner on a life-cycle basis. Promote the widening of the food security basket by encouraging the establishment of Community Grain Banks based on local grains. Organize a Food Guarantee Program combining the principles of Employment Guarantee Scheme and Food for Work.
24. Engender the Food for Work Program so as to assist women to undertake a wide variety of human and social development programs. Sustain, strengthen and spread the on-going self-help revolution by ensuring backward linkages with technology and credit and forward linkages with markets. Enhance the productivity of cropping and farming systems by helping to bridge the prevailing gap between potential and actual yields, through mutually reinforcing packages of technology, services and public policies.
25. Promote a Food based approach to Nutrition Security through the widespread cultivation and consumption of vegetables, fruits and a wide range of millets, legumes and tubers and by introducing a nutrition dimension in land use planning.

Biotechnology

26. The gene revolution should be such that it should not bring about an environmental hazard or tinker in any fundamental manner with the ways of nature. We need new seeds for our farmers, which are drought and pest resistant and bio-fertilizers. We also need bio-fuels to resolve energy crisis.
27. The capability of decision-making in the area of GM food items in the country needs to be reviewed on an urgent basis. It appears that the welfare gains resulting from the health enhancing attributes of golden rice will even dwarf the farm productivity gains in Asia.
28. We need to put resources for appropriate capacity building in the areas of tissue culture and bioengineering, stem cell biology, nano-technology and undertake vast programmes in these areas. A strategic initiative in this direction is highly warranted.
29. The Indian Council of Medical Research and the Department of Biotechnology (Govt of India) have embarked on a stem cell research programme in a mission mode, to promote 'stem cell city clusters', to link all publicly and privately-funded research groups within a city, enabling them to share facilities, ideas, and research and business opportunities, as well as promoting interactions between researchers and clinicians.

Innovation and Intellectual Property :

30. The basic innovation lies in identifying new ways to indigenously develop services and products in India : example Biometrics Suite, menthol mint oil, new molecules.
31. Intellectual and technological capability is concentrated in a small part of the population; every effort should be made to attract and retain capable people.

32. The 92nd Indian Science Congress acknowledges with high esteem of the declaration of the Prime Minister of India, constituting National Science Advisory Council. The scientists look forward to persue the Council's guidance in addressing the challenges facing Indian science.
33. It is recommended that the young scientists may be motivated to work on local problems that are alarming and need indigenous solutions—be it housing, education, food, healthcare, environment, handing of wastes, etc. and build a pool of intellectual property.
34. Awareness of the Indian Science Congress must reach smaller cities and villages, particularly among students. The Children Science Congress should be a part of the Indian Science Congress. It may be worthwhile to introduce a special section titled "Science for School Children", within the framework of the Science Congress. An ideal regime of intellectual property rights would need a balance between the private incentives for innovators and public interest of maximizing access to the fruits of innovation.

Drug Development

35. There are concerns of a global decline in the manufacturing of new drugs in the category of "neglected diseases". Emphasis is required on the upgradation of drugs and technology to tackle diseases prevalent in this part of the world.
36. To rise India as a pharma giant, steps should be taken for quality and quantity of technical manpower, reinforcement of infrastructure and need for expanded spending on R & D in medicinal chemistry, molecular modelling, the study of complex chemical structures, modern analytical techniques, etc.

37. A system should be developed to introduce pharmacology at an earlier stage in education and set up regional drug research centers.

Vaccine Research

38. We should hasten our indigenous vaccines development programme for vaccines against cholera, diarrhoea, malaria, rabies, meningitis, HIV, tuberculosis, and cervical cancer at a fraction of the cost of the imported vaccines.
39. A mechanism may be evolved so that the research institutions and the pharmaceutical industries can effectively participate in the Global HIV Vaccine Enterprise. The Global HIV Vaccine Enterprise will emerge as a massive experiment for a new way of both cooperating towards a common goal in mitigating the deadly diseases of the century while maintaining the essential competition of ideas that compels scientific progress.

Communicable Diseases

40. Tuberculosis—There is a necessity of developing laboratory technique, as clinical diagnosis is insufficient. Basic science needs to be promoted to develop new drug and diagnostic surveillance to be intensified and society has to sustain the quality of DOTS program.
41. HIV—Monitoring strategies are suggested, including expansion in ANC and STI surveillance across the nation to create a central long-term bio-repository. High emphasis should be given to accelerate the development of microbicides, the topical products, to prevent the sexual transmission of HIV/AIDS.
42. Kala Azar—A national action plan is warranted to avert a possible epidemic of this potentially fatal disease.

43. Cholera—It is proposed to set up a global warning system for pre-indication of the cholera outbreak.

44. Bio-Terrorism—The preparedness for bio-terrorism requires strategies for detection, integration, surveillance systems, reporting, communication, vaccine production, regulation and application, as well as judicious implementation of regulatory measures.

Information Technology & Health

45. Every village should have connectivity so that interaction between the people of the country increases and sharing of the knowledge and information takes place efficiently.
46. It is timely to harness this IT revolution as development of high capacity and widely accessible networking infrastructure, that would permit the country's science and technology to flourish domestically and globally. The effective telecommunication policies with proper investment in facilities and training are needed to stimulate entrepreneurship and capital formation in the country.
47. The use of telecommunication, internet and other technologies for connectivity in communication will serve as a backbone for the successful management of science and disease management requirements.
48. The reuse, retrofit and replication of what is developed globally to meet the local in country requirements ; and not "reinventing the wheel" syndrome will support the disease management requirements at a fraction of the cost.
49. Proper communication of science is pivotal to its success, as all of the stakeholders ranging from scientific community, population at large, government

professionals, public policy organizations and science student need many levels of information in many forms and at many stages. It is crucial for optimal communication that “information” be acquired, integrated, managed, analyzed and disseminated on demand, on time and as needed.

50. Science Information delivery and proper communication will dramatically improve the disease management processes of awareness, registry, surveillance, control, prevention, epidemiology clinical research, clinical trials, treatment, care and post treatment care components.

Remote Sensing and Disaster Management

51. Application of remote sensing technology should be strengthened in priority areas like food security, water security, highway planning, railway network, and environmental conservation, weather and ocean state forecasting and disaster support.
52. The seismologists, geologists and other scientists should work to develop suitable natural disasters (Tsunami, Earthquake, etc.) prediction systems. There is a need to strengthen research in this area on a priority basis.

Environment

53. We need to undertake massive remedial measures on four fronts—water, air, soil

and occupational health hazards. Emphasis is required for willful enforcement of regulatory provisions and technology implementation for safeguarding environment and health of the people.

University Education policy

54. The crumbling state of our medical education needs immediate attention.
55. Our universities need to be dynamic and adoptive to the changing needs and priorities of the society and should provide an arena of freedom to young innovative minds. The universities are plagued with a number of problems of teaching faculty and relevance or otherwise of science courses. It is disturbing that there are declining number of students opting for undergraduate courses in basic sciences. The institutes are under-financed and under-staffed.
56. Effort should be made to harness the full potential of trained workforce spread all over the world.
57. Creation of science cadre with the help of strong universities, which would be able to provide high quality science education. A database of experts in frontier areas of science such as nano-technology, genetic engineering, tele-medicines and awareness of patent laws needs to be prepared. It also proposes to set up several centers of excellence in science education throughout the country.

OTHER ACTIVITIES

ISCA Chapters

One of the major objective of the ISCA is to inculcate the temper of science among the people and to encourage young scientist to grow up steadily in this direction involving them in the programmes relevant to fundamental, experimental and operational activities. With these objectives in view, ISCA started establishing Regional Chapters from 1986-87 in different places in India. At present ISCA Chapters are in operation at eighteen places *viz.* Bangalore, Baroda, Bhubaneswar, Bhopal, Bodh-Gaya, Chandigarh, Chennai, Delhi, Guwahati, Hyderabad, Jaipur, Kanpur, Karnal, Kolkata, Mumbai, Nagpur, Patiala and Shillong.

Activities of some of the ISCA Chapters during the year under report are given below :

ISCA Bangalore Chapter

Convener : Prof. Geetha Bali,
Address : Department of Microbiology,
Co-ordinator, Centre for Clean Environment Technology,
Bangalore University, Jnana Bharathi Campus,
Bangalore-560056.

Activities during the year

Lectures : Microbes and microbial products and three popular lectures
Programme : i) Interactive programme between corporation schools and
Bangalore University ii) Visit of Chinese Delegation from
Shangai
Workshop : Fermentation Technology for College Teachers in collabora-
tion with Sartorius Company

ISCA Bodh-Gaya Chapter

Convener : Dr. Arun Kumar Singh,
Address : Reader in Physical Chemistry,
University Department of Chemistry,
Magadh University,
Bodh Gaya-824234.

Activities during the year

Lectures : i) 50 years of DNA Discovery and
ii) Human Genome Project
Programme : Science Quiz, Science Exhibition, Essay Competition

ISCA Bhopal Chapter

Convener : Dr. S. Kulshrestha
Address : Department of Zoology,
Govt. Motilal Vigyan Mahavidyalaya,
Near Old Vidhan Sabha,
Bhopal-462008.

Activities during the year

Programme : Debate competition Programme for school level children. Madhya Pradesh Science Congress-2004 where scientific Papers were presented and young and distinguished scientists were felicitated.

Workshop : i) Environment and Pollution Management for Sustainable Development
ii) Water conservation technique

ISCA Bhubaneswar Chapter

Convener : Dr. S. N. Patro
Address : Vice-President,
Orissa Environmental Society,
ND-4, VIP Area,
IRC Village,
Bhubaneswar- 751015, Orissa.

Activities during the year

Celebration : National Science Day, World Environment Day.

Lectures : i) Life and works of Einstein
ii) Tsunami
iii) Bio-Informatics : Prospects of Biotechnology in 21st Century
iv) Conservation of marine life-Ridley Sea Turtles
v) Crocodiles of Orissa.

Programme : 8th Orissa Bigyan Congress where scientific papers were presented and young scientists as well as distinguished scientists were felicitated. The theme of the congress was 'Health Technology as Fulcrum of Development for the Nation'.

ISCA Chandigarh Chapter

Convener : Prof. R. C. Sobti,
Address : Chairman, Department of Biotechnology,
Panjab University,
Chandigarh-160014.

Activities during the year

- Celebration* : National Science Day
- Lectures* : i) Truth and logics of Physics in everyday science
ii) The importance of understanding the etiology and compelling symptoms of various diseases
iii) Environmental pollution with special reference to indoor pollution
iv) Declining trends in scientific research
- Programme* : Celebration of Helixmania '05, extempore, quiz, science parody.

ISCA Guwahati Chapter

- Convener : Prof. Umesh C. Goswami,
Address : Department of Zoology,
Gauhati University,
Guwahati – 781014.

Activities during the year

- Celebration* : National Technology Day, World Environment Day, World Health Day, World Wetland Day, National Children Day, Earth Day, AID-Awareness Day.
- Lectures* : 10 popular lectures.
- Programme* : Environmental Awareness, Tree Plantation, Health Awareness with reference to Occurance of Malaria, Aids Awareness, Bird Watching, Development of Rural Science Club and Science Exhibition among school students.
- Seminar* : i) Wetland Conservations
ii) Information Highway
iii) National Seminar on Problems and Prospects of Interlinking Major River Systems.

ISCA Hyderabad Chapter

- Convener : Dr. I. V. Subba Rao.
Address : Former Vice-Chancellor,
Acharya N.G. Ranga Agricultural University, Hyderabad,
H.No.1-10-315, Hasmathpet Road, Manovikas Nagar (P.O.),
Secunderabad-500009 (A.P.).

Activities during the year

- Celebration* : World Food Day, Teacher's Day
- Workshop* : Indian Agriculture-in Post WTO era in collaboration with Acharya N.G. Ranga Agricultural University, National Academy of Agricultural Research Management and Rural Science Foundation.
- Programme* : Residential Orientation Programme for Maths and Physical Science Teachers of Schools, Membership Drive Programme.

ISCA Jaipur Chapter

- Convener* : Prof. P. C. Trivedi
- Address* : Head, Department of Botany and
Co-ordinator, P.G.Biotechnology,
University of Rajasthan,
Jaipur – 302004.

Activities during the year

- Celebration* : National Technology Day, World Environment Day, Children Day, World Forestry Day
- Lectures* : i) Important advances in technology for Molecular biology research ii) Human Genome Project iii) HIV-Aids, Bioinformatics iv) The science of stem cells v) The changing scenario herbal drugs.
- Programme* : Tree Plantation, Environment, Quiz Competition, AIDS Awareness, Yoga, Career in Biotechnology.
- National Symposium* : Biotechnology for Food, Health & Environment Security.

ISCA Kanpur Chapter

- Convener* : Dr. P. K. Mathur
- Address* : Head, Zoology Department,
D.A.V.College, Kanpur – 208001.

Activities during the year

- Celebration* : World Environment Day, National Science Day.
- Lectures* : i) Stereochemistry in drug research and total synthesis of biologically active natural product
ii) Environment and Health
iii) Biotechnology in relation to agricultural crops
iv) Nano Technology in defense.
- Programme* : Debate, Quiz and various competition in collaboration with Science Association of Dayanand Girls College.

ISCA Karnal Chapter

Convener : Dr. R. Sahai,
Ex-Director,
National Bureau of Genetic Resources,
231 MIG, Old Housing Board, Sector-13,
Karnal-132001 (Haryana).

Activities during the year

Celebration : National Science Day.
Lectures : i) Role of animals in food security
ii) Scientific temper
iii) Conservation of farm animal : Genetic Resources
iv) Tsunami
Programme : Career counseling, Science quiz, Inter school declamation
contest.
Seminar : Strategies for sustainable use of water resources.

ISCA Kolkata Chapter

Convener : Prof. N. C. Datta
Address : Former Professor & Head,
Department of Zoology, University of Calcutta,
West Bengal State Seed Corporation,
4, Gangadhar Babu Lane, Kolkata-700012
Residence: 110/20, B.T.Road, Kolkata-700108.

Activities during the year

Celebration : Environment Day.
Lectures : i) P. C. Ray Memorial Lecture in collaboration with
Indian Science News Association
ii) Acharya J.C. Bose Memorial Lecture in collaboration with
Jatiya Bignan Parishad.
Seminar : i) Environment and its quality in 21st Century
ii) Environment Issues in Agriculture in collaboration with
National Bureau of Soil Survey and Land Use Planning &
LUP

ISCA Nagpur Chapter

Convener : Prof. R. P. Thakre
Address : Department of Botany,
Nagpur University Campus,
Amravati Road,
Nagpur 440033.

Activities during the year

- Celebration* : National Science Day, World Environment Day.
Lectures : i) River linking
ii) Power of microorganism.
Seminar : i) Growth and Characterisation of Solid Materials
ii) Population and Environment
Programme : Science Exhibition and Poster Competition Programme
Workshop : Preparation of Science projects and models.

ISCA Patiala Chapter

- Convener : Prof. I. J. S. Bansal
Address : Department of Human Biology,
Punjabi University,
Patiala-147002.

Activities during the year

- Celebration* : Science Day
Lectures : Molecular Genetics and Men
Seminar : Science Awareness needs & prospects
Programme : i) Science Quiz contest for rural and urban students
ii) Scientific Model and Exhibition
iii) Face to Face day with NASA Team

ISCA Shillong Chapter

- Convener : Prof. Pramod Tandon
Address : Co-ordinator, Bio-informatics Centre,
Department of Botany,
North-Eastern Hill University,
Shillong-793022.

Activities during the year

- Celebration* : Science Day, World Environment Day
Programme : Orientation on Transit of Venus, Expedition on Transit of Venus at Udaipur and Sikkim, Sit and Draw competition, Meet the Scientist
Workshop : Do IT yourself and understand Science, Use of Drama in Science communication, How to made mathematics interesting and participatory? Counseling session for Students and for their parents facing problems of learning Science, Counseling session on Mars or future home and habitation.

Activities at the ISCA Headquarters

Celebration of Engineer's Day at Headquarters

The 37th Engineer's Day was celebrated by The Indian Science Congress Association on September 15, 2004 in the auditorium of the Association, Kolkata. The focal theme of the day was "Engineers in Environmental Protection". Prof. A. K. Barua, Project Director, Solar Cell Project and Ex-Director, Indian Association for the Cultivation of Science, inaugurated the programme. Prof. K. J. Nath, President, Federation of Public Health Engineers, Mr. Sisir Kumar Banerjee, Chairman, Indian Engineers Federation, Mr. N. B. Basu, Chief Municipal Engineer, Planning and Development Department, Kolkata Municipal Corporation, Dr. H. S. Maiti, Director, Central Glass and Ceramic Research Institute delivered lectures on the focal theme. The programme was attended by a large number of people and got wide coverage in media.

Participation of ISCA in Jatiya Vigyan Mela and Kolkata Book Fair

The Indian Science Congress Association participated in Jatiya Vigyan Mela organized by Vigyan Bhavana and National Environmental Science Academy, West Bengal Chapter at Tala Park from 2nd December to 8th December, 2004. The Association also participated in Kolkata Book Fair at Kolkata Maidan from 26th January to 6th February 2005. All the publications of the Association were displayed in the stall along with photographs of past General Presidents and charts on various activities of ISCA. Enrolment of new members were also done during the fair.

The Visit of Prof. P. Hoodbhoy

Prof. P. Hoodbhoy, Department of Physics, Quaid-e-Azam University, Islamabad, Pakistan has been awarded UNESCO Kalinga Prize for Popularisation of Science 2003. As a part of the award he was invited by Government of India as a State Guest. A lecture of Prof. P. Hoodbhoy was arranged on 6th February 2005 in the auditorium of the Association. The title of the lecture was "Science and Reason in the Age of Unreason". The whole programme was presided over by Prof. Sushanta Dattagupta, Director, S. N. Bose National Centre for Basic Sciences. The lecture of Prof. Hoodbhoy was followed by a lively interaction with Scientists and Press Media. He also visited Central Glass and Ceramic Research Institute, Jadavpur.

Celebration of National Science Day at Headquarters

The National Science Day programme was celebrated in the ISCA premises on 28th February, 2005. The focal theme was 'Celebration of Physics'. The programme was inaugurated by Prof. Amal K. Raychaudhuri, Hon. Visiting Professor, Centre of Relativity & Cosmology, Jadavpur University, Kolkata and INSA Senior Scientist, and the keynote lecture was delivered by Prof. Sushanta Dattagupta, Director, S. N. Bose National Centre for Basic Sciences. The programme was presided over by Prof. Sushil Kr. Mukherjee, Former Vice-Chancellor, Calcutta University.

On this occasion Jawaharlal Nehru Birth Centenary Award Lecture for the year 2004-2005 and Dr. B. C. Deb Memorial Award Lecture for Popularization of Science for the year 2004-2005 were delivered by Prof. P. N.

Srivastava, Professor Emeritus, Jawaharlal Nehru University and Shri Shrikanta K. Panigrahi, Director (Environment), Planning Commission, New Delhi respectively. The Kerala Sasthya Sahitya Parishad, Thiruvananthapuram also received the Jawaharlal Nehru Prize for the year 2003-2004.

A symposium on “Health Technology as Fulcrum of Development for the Nation” was also arranged wherein some ISCA Young Scientists Awardees participated.

Unveiling of the Bust of Sir Asutosh Mookerjee

On March 27, 2005 the bust of Sir Asutosh Mookerjee, the founder President of the Indian Science Congress Association was unveiled by Prof. A. K. Sharma, past General President of ISCA. Shri Subrato Mukherjee, Hon’ble Mayor, Kolkata graced the occasion as special guest. Prof. N. K. Ganguly, General President of ISCA presided over the programme.

On this occasion S. S. Bhatnagar Award Lecture for the year 2004-2005 and B. C. Guha Memorial Lecture for 2004-2005 were delivered by Prof. P. Balaram, Professor, Molecular Biophysics Unit, Indian Institute of Science and Dr. Sujit Kumar Bhattacharya, Director, National Institute of Cholera and Enteric Diseases respectively.

Visit of Shanghai Association for Science & Technology (SAST)

A delegation from Shanghai Association for Science & Technology (SAST) visited The Indian Science Congress Association, Indian Association for the Cultivation of Science,

Central Glass and Ceramic Research Institute, National Council of Science Museum, Birla Industrial and Technological Museum on March 28, 2005 and interacted with the scientists.

Collaborative Programmes

The Indian Science Congress Association in collaboration with Jatiya Vigyan Parishad observed the 143rd Birth Day of Vigyanacharya P.C.Roy on August 3, 2004 with proper dignity.

Two-day seminar was organized by Indian Sports Medicine in collaboration with The Indian Science Congress Association, Kolkata during January 15-16, 2005 at ISCA auditorium on the occasion of 6th Annual Conference of the Sports Medicine. The key theme of the conference was “Scientific approach towards excellence of sports”.

Publications

This is a very important and significant activity from the angles of both dissemination of scientific knowledge and projection of Association’s image. The year under report witnessed a significant number of publications brought out by the Association. Proceedings of the Ninetysecond Annual Session of the Indian Science Congress Association were published (Part I, II, III & IV). The bi-monthly journal Everyman’s Science (Vol.XXXIX Nos.1-6) was brought out.

Other publications brought out were: ISCA Directory : 2004-2005, Annual Report : 2003-2004, List of Office-Bearers & Sectional Committees for 2004-2005, Honorary Member, Donor & Life Members for 2004-2005, Members (With Voting Right) for 2004-2005, Synopses of the Presentations of ISCA Young Scientist Awardees for 2004, etc.

Library Service

During the year under report, the Library of the Indian Science Congress Association subscribed to 8 Indian journals and 15 Foreign journals. List of these journals are given below :

Indian

Current Science
Down to Earth
Indian Journal of Experimental Biology
Indian Journal of Biochemistry and
Biophysics
Indian Journal of Marine Sciences
Pramana
PTI Science Service
Science Reporter

Foreign

Ambio
American Scientist
Endeavour
Interdisciplinary Science Reviews
International Studies in the Philosophy
of Science
Journal of Environmental Planning and
Management
Nature
Natural History
New Scientist
Policy Studies
Science
Science & Society
Social Choice and Welfare
Technology Analysis & Strategic
Management
Tropical Science

In addition to those subscribed above, the following journals/newsletters are also being received by the Library in exchange of the Association's journal "Everyman's Science" :

Chemecology
CSIR News
DRDO News
Environmental Awareness
Environmental Health Perspectives
Gana Darpan
Gyan Bigyan
IASSI News
INSA News
ICSSR Newsletter
Indian Journal of Physics
Indian Spices

JIMA
Journal of Forensic Sciences
Medicinal and Aromatic Plant Abstracts
Nutrition News
Natural History (Bombay)
S & T Post
Science & Culture
Spices India
University News
UNESCO News
WMO Bulletin
WISTA

The Library is open to all category of members of the Association as well as school, college and university teachers on all weekdays (except Saturday, Sunday and holidays) from 10.00 a.m. to 5.30 p.m.

MISCELLANY

Obituary

During the year under report the Executive Committee, the Council and the General Body recorded their deep sense of sorrow at the passing away of **Shri P.V.Narasimha Rao**, Honorary Member of the Association; **Dr.Sachchidananda Banerjee**, President, Section of Physiology, 39th Session of the Indian Science Congress (1951-52); **Prof.Manindra Mohan Chakrabarty**, President, Section of Engineering Sciences, 73rd Session (1985-86); **Prof.R.C.Mehrotra**, President, Section of Chemistry, 54th Session (1966-67) and General President, 66th Session (1978-79); **Dr.Raja Ramanna**, President, Section of Physics, 50th Session (1962-63); **Prof.A.S.Mukherjee**, Recorder, 64th & 65th Sessions (1976-77 & 1977-78) and President, 73rd Session (1985-86), Section of Zoology, Entomology & Fisheries and also General Secretary (Headquarters) from the year 1997-1998 to 1999-2000; and **Prof.A.S.Paintal**, General President, 72nd Session (1984-85).

ISCA Meetings

Following meetings of different bodies were held during the year 2004-2005 :

Name of the Body	Meetings held on
<i>General Body</i>	January 7, 2005
<i>Council</i>	October 10, 2004 and January 2, 2005 (adjourned to January 7, 2005)
<i>Executive Committee</i>	May 16, 2004; October 10, 2004 and January 2, 2005 (adjourned to January 7, 2005)
<i>Advisory Committee</i>	May 15, 2004
<i>Finance Committee</i>	May 15, 2004 and October 9, 2004
<i>Establishment Committee</i>	May 15, 2004 ; October 9, 2004 and January 2, 2005
<i>Publication Committee</i>	May 15, 2004
<i>Endowment Committee</i>	May 16, 2004 and October 9, 2004
<i>Standing Committee on Science and Society</i>	May 15, 2004
<i>Sub-committee on Elections to the various bodies of ISCA</i>	July 15, 2004 and September 24, 2004

Besides, two meetings of the General President with Sectional Presidents of 92nd Indian Science Congress were held on May 16, 2004 and October 10, 2004. Also, a meeting of Conveners of ISCA Chapters was held on January 2, 2005.

ISCA Representation in other Organizations

ISCA Members represented in the following organizations during 2004-2005 :

Indian National Science Academy, New Delhi: Dr. Sandip Kumar Basu, Director, National Institute of Immunology, New Delhi – *Member of the INSA Council;*

Post Graduate Institute of Medical Education and Research, Chandigarh:

Prof. B. P. Chatterjee, General Secretary (Headquarters), ISCA, Department of Biological Chemistry, Indian Association for the Cultivation of Science, Kolkata – *Member of Institute Body of PGIMER;*

All India Institute of Medical Sciences, New Delhi: Prof. B. P.Chatterjee, General Secretary (Headquarters), ISCA, Department of Biological Chemistry, Indian Association for the Cultivation of Science, Kolkata – *Member of the Institute Body of AIIMS;*

Indian National Academy of Engineers, New Delhi: Dr. S. R.Singh, Vice-Chancellor, Rajendra Agricultural University, Bihar, Pusa (Samastipur) (Upto December 31, 2004) and Dr.A.P.Mitra, Past General President, ISCA, Honorary Scientist of Eminence, National Physical Laboratory, New Delhi – *Member of the Governing Council of INAE.*

Representation in Foreign Scientific Meeting

Prof. S. P. Singh, General Secretary (Outstation), ISCA, Professor Emeritus, Department of Chemistry, Kurukshetra University, Kurukshetra, represented the Indian Science Congress Association in the BA Festival of Science held in University of Exeter, South West England from September 6-10, 2004.

Membership

The trend in Membership of different categories during the last three years can be observed from the following table :

	90 th Session (2002-2003)	91 st Session (2003-2004)	92 nd Session (2004-2005)
Life Member	9,950	10,309	10,800
Member	2,050	2,920	3,855
Sessional Member	2,415
Student Member	304	970	1,225
Total	14,719	14,199	15,880

Administrative and Financial Set-up*

Reservations/Concessions for the SC/ST employees of the ISCA to safeguard their interest, as per policy of the Govt. of India.

The Association is following the policy of the Government of India in the matter of recruitment of its staff member. The roster showing the reservation of the post for SC/ST is maintained and given effect by the Executive Committee to this purpose.

* In accordance with the suggestion given by DST in its letter No.AI/AR/004/2001 dated 10-10-2001 the above materials on administrative and financial set-up are also furnished.

A brief with regard to monitoring of Personnel Matters related to the employees of ISCA.

No personnel matters of employees of ISCA was monitored during the year.

Implementation of the Official Languages Policy/Act i/c instructions issued thereunder from time to time.

Steps to implement the provisions of Official Languages Policy as adopted by the Government of India from time to time, have been taken by the Association by way of printing of letterheads, title headings in different registers, name plates of different sections, membership forms, service book, annual report, etc. in bi-lingual forms.

A report with regard to redressal of employees' grievances.

The General President holding the office in the consultation with the Executive Committee takes care of employee's grievances whenever such grievances are brought to his notice.

Welfare measures

No staff welfare matters was taken during the year under report.

Staff-strength (group-wise), Administrative/Technical preferably while giving strength of SC/ST i/c OBC employees.

Staff Sanctioned Strength as on 31.03.2005**

Category	Designation/Group	S.S.	F.S.	V.Ps
<i>Administrative</i>	Executive Secretary	1	-	1
	Asstt.Executive Secretary	1	1	-
	Group II(3) (Office & Supporting Technical Staff)	3	3	-
	Group II(2) (Office & Supporting Technical Staff)	5	5	-
	Group II(1) (Office & Supporting Technical Staff)	9	8	1
	Staff-Car-Driver	1	1	-
	Group I(2) (Helper)	1	1	-
	Group I(1) (Helper)	11	8	3
Total		32	27	5

S.S. : Staff Strength

F.S. : Filled Strength

V.Ps : Vacant Posts

** Prepared on basis of the resolution taken by the Establishment Committee at its meeting held on September 17, 1994 and approved by the Executive Committee in its meeting held on October 7, 1994.

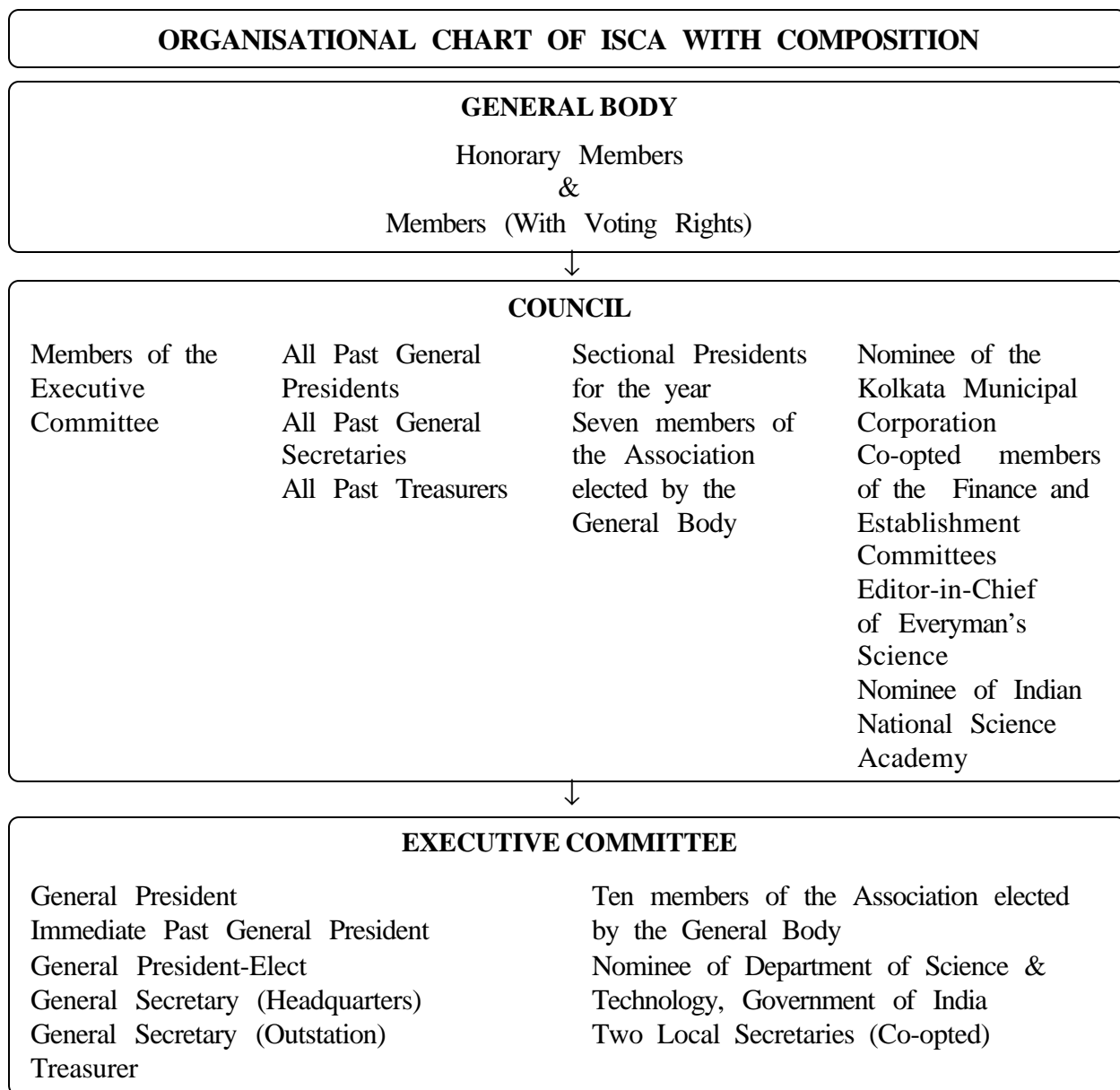
The Grants-in-Aid received from the Department of Science & Technology, Govt. of India under Plan & Non-Plan heads during the year.

2004-2005

Plan - Rs.120.00 lacs.
Non-Plan - Rs. 31.00 lacs.

The composition of the GC, GB, FC, RAC, and any other important Committee constituted, in the beginning of the annual reports.

The organisational chart of ISCA with composition and Statutory Committees and their composition are given below. These Committees were constituted in the beginning of the year under report.



STATUTORY COMMITTEES AND THEIR COMPOSITION

(I) Advisory Committee

(i) General President	...	Chairman
(ii) General Secretary (Outstation)	...	Member
(iii) Treasurer	...	Member
(iv) Six permanent Members of the ISCA Council nominated by the Executive Committee	...	Members
(v) General Secretary (Headquarters)	...	Convener

(II) Finance Committee

(i) General President	...	Chairman
(ii) Immediate Past General President	...	Member
(iii) General President-Elect	...	Member
(iv) General Secretary (Headquarters)	...	Member
(v) General Secretary (Outstation)	...	Member
(vi) One Co-opted member resident in Kolkata to be nominated by the General President	...	Member
(vii) Nominee of DST	...	Member
(viii) Treasurer	...	Member-Convener
(ix) Executive Secretary	...	Secretary (without voting right)

(III) Establishment Committee

(i) General President	...	Chairman
(ii) Immediate Past General President	...	Member
(iii) General President-Elect	...	Member
(iv) General Secretary (Outstation)	...	Member
(v) Treasurer	...	Member
(vi) Two Co-opted members resident in Kolkata to be nominated by the General President	...	Member
(vii) General Secretary (Headquarters)	...	Member-Convener
(viii) Executive Secretary	...	Secretary (without voting right)

(IV) Publication Committee

(i) General President	...	Chairman
(ii) General Secretary (Outstation)	...	Member
(iii) Treasurer	...	Member
(iv) Editor-in-Chief	...	Member
(v) One nominee of General President	...	Member
(vi) General Secretary (Headquarters)	...	Member-Convener
(vii) Executive Secretary	...	Secretary (without voting right)

(V) Endowment Committee

(i) General President	...	Chairman
(ii) General Secretary (Outstation)	...	Member
(iii) Treasurer	...	Member
(iv) Two members from the Council of ISCA nominated by the Executive Committee	...	Members
(v) One External Expert nominated by the General President	...	Member
(vi) General Secretary (Headquarters)	...	Member-Convener
(vii) Executive Secretary	...	Secretary (without voting right)

(VI) Standing Committee on Science and Society

(i) General President	...	Chairman
(ii) Three permanent Members of the ISCA Council nominated by the Executive Committee	...	Members
(iii) General Secretary (Outstation)	...	Member
(iv) Treasurer	...	Member
(v) General Secretary (Headquarters)	...	Member-Convener

ACKNOWLEDGEMENTS

The Executive Committee of the Indian Science Congress Association (ISCA) is grateful to the Department of Science & Technology, Government of India, for the generous grant-in-aid to the Association. The Committee would also like to record its deep appreciation of the continued help and cooperation received from officers and staff of DST.

The Executive Committee records its appreciation of the personal interest taken by the Vice-Chancellor, Nirma University of Science & Technology. Sincere thanks are also due to the Local Secretaries and their associates, Sectional Presidents, Sectional Recorders, Local Sectional Secretaries, and Members of the Sectional Committees for their untiring efforts to make the 92nd Indian Science Congress a grand success.

The Executive Committee also expresses its indebtedness to the Council and the Members of the General Body as also Members of the different Committees and Sub-Committees for their guidance and advice. In referring to the success achieved at the Ahmedabad Session, it is a pleasure for the Committee to record its gratefulness to the General President, Prof.N.K.Ganguly for his continuous effort for the success of the 92nd Indian Science Congress.

The Executive Committee expresses its gratitude to Prof.Asis Datta, Immediate Past General President for providing donation through Local Secretaries of the 91st Indian Science Congress being the unspent balance and a savings of the above Congress for instituting an award named as “Excellence in Science and Technology”. Also, the financial support to meet the cost of erecting a bust at ISCA premises, Kolkata of Sir Asutosh Mookerjee, Founder and first General President of the Indian Science Congress Association was provided by Prof.Datta.

The Committee further expresses its gratitude to the Infosys Foundation, Bangalore for providing donation for instituting awards in the name of “Infosys Foundation—ISCA Travel Award” where five students (upto Class XII) will be paid TA, hospitality and a Plaque for attending the Science Congress Sessions. The Committee expresses its indebtedness to the University Press (India) Pvt. Ltd., Hyderabad for providing Royalty for the period 2002-2003 and 2003-2004 from selling out of the Special Volume on “Shaping of Indian Science” published by the ISCA on the occasion of the 90th Indian Science Congress. The amount accrued from interest of Royalty will be used for funding five deserving students to attend the Science Congress Sessions from 2004-2005 onwards.

Last but not least no record of acknowledgement could be complete without expressing the Committee’s deep appreciation of the work done by the staff of the Association throughout the year.