



NIAS

NEWS

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No. 2

This ninth issue of the NIAS Newsletter covers the activities of Nineteen Ninety Six in brief and that of the second half of the year in particular.

Apart from the 10th NIAS Course on "An Integrated Approach to Knowledge and Information" for Senior Executives from the Government / Public / Private Sectors held between January 8 and February 3, 1996, the 4th NIAS Course on "An Integrated Approach to Knowledge and Information" for University / College Teachers was held between October 7 and November 2, 1996. As is well known, this course is co-sponsored by University Grants Commission and Jawaharlal Nehru Centre for Advanced Scientific Research. The course was inaugurated by Prof. N.R. Madhava Menon, Director, National Law School of India University and the theme of the inaugural address was "Globalization and future of higher education - Challenges and responsibility". A gist of the inaugural address appears in the Newsletter.

The valedictory address on the last day of the course was delivered by Dr. Raja Ramanna and the theme of his address was "Changes in scientific thought in the 19th and 20th centuries".

The subjects covered, in keeping with the objective of integrated approach to knowledge and information, were of a wide-ranging spectrum, including topics such as Alienation of Indian Youth, Origin



Participants of the 4th NIAS Course for University / College Teachers with the Faculty.

of Man, Sociology, India's Changing Role in the Post-Cold War World, Philosophy of Science, Science in Education, The Power of the Atom, Electronics & Industry, Antarctica, Creativity in Indian Science, Mental Illness, Medicine at Cross Roads, Recent advances in Neurological Research and Practice, Origin of Universe, Ecology, Pesticide Pollution: Problems and Approaches to Remediation, The Vedic and Darsana Tradition of Knowledge Communication and Methodology, Aspects of Scientific Discovery, and Appreciation of Cinema.

Yet other subjects covered by way of Special Lectures were "What is happening to Caste?" by Prof. M.N. Srinivas, "Are there limits to Scientific Explanations?" by Prof. B.V. Sreekantan, "National Security and Modern Weapons" by Dr. Raja Ramanna, and "Indian Economic Reforms" by Shri. T.N. Ninan.

Two other important features of this course were a Symposium on "Towards Gender Justice: Challenges & Dilemmas" by Ms. Srilatha Batliwala and her team and a day-long exposure to "Appreciation of Indian Classical Music" by Ms. Aditi Upadhyaya. Visits to Shravanabelagula, Belur and Halebid, National Institute of Mental Health and Neurosciences, and Nrityagram were also arranged. The course was very well-received by the participants.

One of the most important events of the second half of the year was an International Seminar on "Nuclear Cooperation: Challenges and Prospects" held between November 21 and 22, 1996 at NIAS. The delegates were experts from U.S.A, France, Japan, South Korea and Austria, in addition to counterparts from India. A brief report on this Seminar appears in the Newsletter.

Yet another important event was the publication of a report entitled "India's Options on the Comprehensive Test Ban Treaty". This report emanated from a Workshop organised by NIAS and was attended by a number of experts holding a variety of perspectives. The report is available in the Institute.

From the Director's Desk

During the year 1996, NIAS, through its work, has reached the status of a National Think-Tank. It has contributed in many ways through its lectures, seminars, group discussions, etc. in various fields of knowledge. The work done in the Institute is based on actual visits and field studies and therefore, its reports are of very authentic value.

The Auditorium, which forms part of the JRD Tata Memorial Centre, has been completed and it will be used for Lectures, Concerts, Plays, Exhibitions, etc. The auditorium will formally be inaugurated sometime in March, 1997.

The NIAS Library is being built-up on the basis of modern development, using CD-ROMs so

that a large amount of information is available in a small amount of space and thereby requiring only a small-sized library. Thus, it also avoids encroachment of the green space of the Campus. We were glad to note that many people have offered books of importance to the library which will improve its usefulness.

The regular Associates' Programme, held on last Friday of every month, has attracted the attention of the public of Bangalore and is well-attended. The variety of subjects in these lectures has helped in keeping citizens of Bangalore informed about the problems of the world, the country and the city in particular. Very well-known personalities have delivered lectures in these programmes.

THE FACULTY

The activities of the various units of the Faculty during the second half of the year are indicated unitwise in the succeeding paragraphs:-

UNIT: HEALTH AND HUMAN BEHAVIOUR Activities of the Unit:

The Project on "A Psycho-social Study of Alienation amongst Indian Youth" was completed and the report submitted to the Defence Research and Development Organisation (DRDO), Government of India, New Delhi, on September 2, 1996.

The study on "Creativity amongst Indian Scientists" is nearing completion. The data has been collected and the analysis is in progress. The work should be completed by May, 1997.

Dr. Biswajit Sen was promoted as Professor of Psychiatry within the Unit of Health and Human Behaviour on 1 July, 1996. Prof. Sen was also awarded a MacArthur Foundation Fellowship to conduct a study on "Psychosocial Factors Influencing the Sexuality of Urban Indian Women". He has already started his work and is currently in Calcutta doing the field work.

Prof R.L. Kapur has been asked to write a book on "Generation Gap" by the National Book Trust of India, New Delhi.

MacMillan India has agreed to publish the proceedings of the workshop on "Qualitative Methods in Research".

The IDRC (International Development Research Centre) is currently engaged in building new initiatives in psycho-social research. In this connection, Prof. Kapur was invited to attend the regional workshop on "Values, Psycho-social Health and Development" with the representatives from India, Pakistan, Bangladesh and Srilanka from 27-29 November, 1996. A number of research ideas around this topic were formulated as being of special importance for the region. Prof. Kapur stressed that research should shift from the study of negative attributes to more positive ones. For example, instead of studying those who breakdown in response to social stresses, one should look for resilience and study the characteristics of those people who not only withstand stress themselves but also help others to cope. In the similar way, one should now shift from examining the consequences of violence or the characteristics of violent people to the study of peace processes. These views were accepted.

Prof. Kapur has been invited to Ottawa, Canada, as a member of a core group, which will present the research proposals to the IDRC council.

UNIT: PHILOSOPHY OF SCIENCE

Dr. Sundar Sarukkai's work on Philosophy of Science and Mathematics, Postmodern Philosophy and Phenomenology continues. One of his recent papers dealt with explicating the notion of 'Other' as it occurs in anthropology and philosophy and suggests a way to understand fiction as a valid ethnographic tool. Another paper deals with some foundational ideas of consciousness and suggests some ways of understanding the problem of consciousness through certain arguments in the philosophy of mathematics. He is presently co-authoring a book on Postmodernism in the Indian context. He is also involved in a study of the philosophy of the body drawing upon Indian and Western philosophical traditions. This work is in collaboration with Prof. James Morley, St. Joseph's College, Connecticut, USA.

CONSCIOUSNESS STUDIES

Active work is in progress in CONSCIOUSNESS STUDIES. The lecture series covering various issues of consciousness studies continued. The three broad topics covered by the lectures were neurobiology of consciousness and yogic practices, the physics, chemistry and neurobiology of consciousness and some philosophical problems of consciousness. These lectures were given by Dr. B.L. Meti, Prof. B.V. Sreekantan and Dr. Sundar Sarukkai, respectively. The discussions which followed the lectures tried to outline the current trends in the respective fields and address the key problems envisaged by consciousness studies with regard to its theme and methodology.

Dr. Sangeetha Menon is continuing her work in the area of Bhagavad Gita and Advaita Vedanta along with the organising of lectures, discussions and review meetings on CONSCIOUSNESS STUDIES. An attempt is being made to identify major research work being carried out on consciousness and related areas in and outside the country so as to facilitate a network, and update the bibliography on consciousness studies. In this connection, a review meeting was held to discuss and identify the tasks to be undertaken by the CONSCIOUSNESS STUDIES group. The meeting, attended by Prof. B.V. Sreekantan, Dr. Sangeetha Menon, Dr. M.G. Narasimhan and Dr. Anindya Sinha, reviewed in detail the progress of work and identified the issues to be covered in the recent future.

Dr. Anindya Sinha has recently joined the CONSCIOUSNESS STUDIES group. He will be concentrating on the areas of social behaviour, cognition and self-awareness in wild primates with particular reference to bonnet macaques.

LECTURES AND MEETINGS ORGANISED ON CONSCIOUSNESS STUDIES:

1. July 24 & August 2, 1996 - Two lectures by Dr. B.L. Meti (Assistant Professor of Neurophysiology, NIMHANS) on "Neurobiological aspects of consciousness and Yogic practices". Dr. Meti gave a general picture of neurobiological systems with emphasis on sleep-wakefulness cycle alteration in the practitioners of Yoga.
2. September 25, 1996 - Lecture by Prof. B.V. Sreekantan on "The physics, chemistry and neurobiology of consciousness - The New Wave studies". Prof. B.V. Sreekantan presented a detailed and integrated analysis of the current research data on the neurophysiological and neurochemical studies of consciousness. He highlighted some aspects of biophotonic studies which support liquid crystalline structures of cells and possibilities of large-scale quantum coherence that may help in resolving the 'binding' problem in consciousness studies.
3. September 27, 1996 - Lecture by Dr. Sundar Sarukkai on "What is Consciousness?". Dr. Sarukkai's lecture highlighted what he considered as some foundational problems in undertaking studies on consciousness. He developed some arguments from the philosophy of mathematics regarding the notions of real and abstract, related it to similar problems in consciousness and finally suggested a nominalistic view of consciousness.
4. October 4, 1996 - Review Meeting on the activities of Consciousness Studies group.

UNIT: WOMEN'S POLICY RESEARCH AND ADVOCACY

Study of Status of Women in Karnataka:

During this period, data collection in the remaining three out of the total six districts being covered by the study was completed; viz., Raichur, Bijapur, and Kodagu. In all, 1140 households have been covered, comprising 1140 women and 1140 men. Checking of schedules was also completed. Data entry is proceeding apace, and should be

completed by December 31, 1996. Preliminary tables will hopefully become available for analysis by January 1997, after which report writing will begin in right earnest. The Unit hopes to have a draft report of the study ready by June, 1997, for wider circulation.

In addition, an in-depth analysis of data on crimes against women has been initiated during this period, to supplement the data collected as part of the Status of Women primary research study.

Advocacy:

The major advocacy work undertaken during this period has been in the form of training and inputs on different dimensions of women's status provided by Unit members in different international, regional and local workshops, conferences and training programmes. These are mentioned in the list of workshops attended, and include major inputs on gender relations, women's empowerment, status of women in India, and methodologies for studying gender relations. The Unit is also engaged in developing the gender component for the Training Module for Primary School Teachers of the districts covered by the District Primary Education Project (DPEP), Government of Karnataka. Similarly, the Unit is participating in a brainstorming session of the Ford Foundation for the development of their funding strategy in the area of Reproductive Health. The Unit also conducted a Symposium entitled "Towards Gender Justice" for the participants of the Fourth NIAS Course for University/College Teachers.

Finally, a large number of students, researchers and scholars from abroad and within India have been visiting the Unit, using the library and resource material, and taking help in developing their conceptual understanding and analytical perspectives, as well as accessing information for their ongoing work and projects; for instance, consultants working on developing gender strategies for funding agencies and NGOs, journalists writing on women's issues, students working on research papers and dissertations, etc.

The Unit has also published the report "Women and Literacy", containing the edited proceedings of the conference on the same theme held in 1994. The document contains a benchmark collection of innovative grassroots programmes promoting women's literacy. This publication has been widely disseminated and has received excellent response from all concerned, including

the Director General of the National Literacy Mission.



Field Investigators interview Women and Men for the study on Rural Women

UNIT: ENVIRONMENT

Dr. P.K. Shetty is continuing his collaborative Research Programme with Prof. K.M. Madhyastha, Organic Chemistry, Indian Institute of Science, Bangalore and Dr. K. Raghu, Nuclear Agriculture Division, Bhabha Atomic Research Centre, Mumbai on 'Bioremediation of pesticide-contaminated soils and effluents'.

During the last six months, a series of experiments were carried out to establish the mode of microbial degradation of two of the most widely used pesticides in Indian agriculture such as *Atrazine* (2 - chloro - 4 - ethylamino - 6 - isopropyl amino - s - traizine) and *Endosulfan* (1, 2, 3, 4, 7, 7 -hexachloro bicyclo - (2.2.1) - hepten-2, 3 - bisoxymethylene -5, 6-sulfate).

Technical grade atrazine and endosulfan were used for degradation experiments and the purity was above 99.5%. All other chemicals used were of analytical grade. Three metabolites of endosulfan such as endosulfan sulfate, endosulfan diol and endosulfan ether were chemically synthesised and purified in the Laboratory.

Thirty different fungal strains were isolated from enrichment culture technique and also a few identified strains such as *Aspergillus* sp., *Trichoderma* sp., *Fusarium solani*, *Mucor thermohyalospora*, *Penicillium* sp. were tested for their ability to bring about transformation in these pesticide molecules.

The present study has clearly demonstrated the transformation of endosulfan by *Mucor thermohyalospora*. The preliminary analysis of the

culture extract revealed the presence of four metabolites derived from endosulfan which were not seen in the control experiments. The R_F values of two of the metabolites were found to have identical R_F values with that of synthetic endosulfan ether and endosulfan sulfate (Hexane: Chloroform: Acetone (9:3:1) solvent system). However, further spectral and chemical analysis is required to conclusively identify these metabolites.

Similarly, *Mucor piriformis* isolated from soil has shown to bring about transformation of atrazine. Fermentation carried out in neutral media for a period of 8-9 days resulted in the formation of at least three metabolites which were not seen in the control experiments. The isolation and identification of these metabolites is under progress.

Ms. Namitha K.K. and Ms. M. Radhika are assisting Dr. Shetty in this programme. Mr. Deepak Jain and Mr. Nanda Kumar have completed their M.Sc. programme under the guidance of Dr. Shetty. They have worked on fungal transformation of endosulfan and atrazine respectively. Their theses has been submitted to the Department of Environment Sciences, Bangalore Univeristy.

UNIT: EPIGRAPHY CENTRE

Dr. H.K. Anasuya Devi is continuing her research on Epigraphy. Readers may recall that the establishment of Epigraphy Centre was reported in the previous newsletters. The on-going activity pertaining to collection of source materials from Archaeological Survey of India (ASI), Mysore, obtaining relevant data, analysis by implementing software packages such as MATLAB, KHOROS on IBM and SUN workstations have been reported earlier.

Very crucial to all these activities is the establishment of an *Epigraphy Centre* which required large-scale funding. Based on the detailed proposal made to Indian Space Research Organisation (ISRO), Bangalore, a RESPOND Project entitled "Development of Software Technology for Epigraphy Texts" has been sanctioned.

Objectives:

To create a knowledge-based environment for epigraphy studies.

To create epigraphic databases that help in preventing the various ancient manuscripts in floppies and on CD-ROM, which preserves

thousands of data sets in a compressed format without deterioration with time.

To remove noise in the epigraphy data and assist the epigraphists to build an environment by computerization of epigraphic data tools, and if possible, help in recognising some characters without much human intervention.

With the help of this knowledge base, it is hoped that the machine can recognise a set of known characters by matching techniques. Ultimately, the computer will be used to automatically decipher the unknown epigraphic texts.

Achievement:

Any epigraphic source material can be converted from analog to digital data. This is possible through computer readable formats - floppies, CD-ROM diskettes.

At the same time, using software packages, it is possible to some extent to remove the noise in the data. The software that can be used are: MATLAB on IBM, KHOROS on SUN and Image Works, and Image Vision Libraries available on SGI indigo-2 R4400 workstations.

Progress made during last six months:

There has been a break-through in terms of results obtained using image works and vision libraries on SGI platform. Sample data considered for the purpose has been tried out on SGI machine, indigo-2 R4400, with a view to clearing both background and foreground noise in the digitized sets. Interesting results have been obtained. To mention a few, different types of filtering, edge detection, sharpening of images, Boolean operations, Erode, Laplace transformation, Roberts, Sobel, Compass have been applied.

The above techniques point out the different types of edge detection and contouring algorithms applied on the selected data: finally help in removing both background and foreground noise, keeping the character sharpness intact. Further, this helps in character recognition. KHOROS software has been used for different sets of data. Meaningful results are being obtained.

MATLAB package has been used for different sets of data. The bmp files have been obtained. Median filtering, thresholding of the images and perimeter of the thresholded image on the above sets of data are in progress.

Future Plan:

Setting up of an image-processing workstation will be undertaken along with the establishment of scanner, laser printer and a few Pentium machines to pursue the research work on computer-based studies on epigraphy.

UNIT: INTERNATIONAL AND STRATEGIC STUDIES (ISS)

This unit comprises Dr. Raja Ramanna, Dr. Deepa Ollapally, Mr. S. Rajagopal and Mr. Arvind Kumar. Activities of the unit are focused on the areas of nuclear non-proliferation, India's strategic relations, and nuclear technology, with the objective of providing critical analysis for research and policymaking. The promotion of international cooperation in the nuclear field is also an important goal.

Nuclear Non-proliferation:

In contributing to the national debate on the Comprehensive Test Ban Treaty (CTBT), which was submitted to the United Nations on September 1996, the ISS Unit published a report entitled "India's Options on the Comprehensive Test Ban Treaty." This report was widely received and cited in India and abroad. It was the first report of its kind to seriously consider the full range of options open to India and expected ramifications. The report was based on an earlier workshop on the CTBT held at NIAS on March 28, 1996 which was attended by India's top experts in the field and chaired by Dr. Ramanna.

Nuclear Technology and India's Strategic Relations:

From November 20 to 22, 1996, the ISS Unit held an "International Seminar on Nuclear Cooperation: Challenges and Prospects" to begin a dialogue on international collaboration, particularly in light of the changed circumstance since the end of the cold war. The Seminar had a unique blend of nuclear technologists and scientists as well as defense experts. It was designed to explore the synergy between technology and political affairs and to identify the challenges. Nearly 25 participants from India, France, The International Atomic Energy Agency, Japan, Korea and the United States attended. The Unit is preparing a volume of conference proceedings based on the papers presented.

Future activities of the Unit will include the formation of a series of working groups on India's technical and strategic relations. The emphasis will be on Indo-U.S. cooperation.

CANTOR'S THEOREMS AND NUCLEAR STRUCTURE

Raja Ramanna

The work has been extended, using the Cantor's Theorem in understanding lifetimes of β emitting nuclides obtain their ground state spins. Using the measured lifetimes which contain latent information on many aspects of the nuclei it is possible to obtain the ratio of resonance energy and the resonance width levels of light nuclei. Using an empirical relation, it is now possible to identify the elementary particle involved in the excitation process. It has been shown that the excited states of various light nuclei result from the exchange of virtual mesons.

The work reported earlier has appeared in the International journal of Modern Physics A and Modern Physics Letters A.

VISITING CHAIRS

HOMI BHABHA CHAIR PROF. C.V. SUNDARAM

The Homi Bhabha Chair is presently devoted to studies relating to Energy, Materials and Environment.

On the suggestion of the Department of Atomic Energy (Government of India), a project has been undertaken to write a History of the Department and its programmes, for the first fifty years, commencing from 1948. To start with, material has been gathered on the evolution of the programme in the early years - covering the periods of Dr. Homi Bhabha (1948-1966) and Dr. Vikram Sarabhai (1966-1971), who were the first two Chairmen of the Atomic Energy Commission. Interviews have been recorded with senior scientists and engineers who had been associated with the Programme from the early stages.

During the period under review, studies were also carried out on specific aspects such as the Global perspective and the Indian Scenario in regard to Nuclear power generation, Rare metals development and Current technology trends, Radio-active waste management, Applications of radio-isotopes etc. - for lecture presentations and technical articles.

J.R.D. TATA CHAIR PROF. M.N. SRINIVAS

Prof. M.N. Srinivas published an essay on R.K. Narayan entitled "The Writers' World", in Frontline, Vol. 13, No. 20, October 5-18, 1996. Prof. Srinivas is about to complete a professional paper

on his sociological contributions to the ANNUAL REVIEW OF ANTHROPOLOGY, U.S.A., 1997. This paper is being prepared at the invitation of the editor of the ANNUAL REVIEW.

SENIOR HOMI BHABHA FELLOW PROF. B.V. SREEKANTAN

Prof. Sreekantan has continued his efforts at writing a comprehensive book on several aspects of Cosmic Rays. He has been invited by the Asiatic Society to contribute an article on "Cosmic Rays" for the Encyclopedia Asiatica. He continues to be associated with the Institute's programme on Consciousness Studies.

ASSOCIATES' PROGRAMME

The Associates' Programmes are being held regularly as per schedule and all the programmes have been well-received.

At the beginning of the year we had 333 Senior Associates on our roll. As of date, we have 416 members on our roll.

The topics of the Associates' Programme during the period were:-

1. July 26, 1996 - A lecture on "RETHINKING DEVELOPMENT" by Dr. Shobha Raghuram, Deputy Director, Regional Office, HIVOS, Bangalore.
2. August 30, 1996 - "VEENA RECITAL" by Shri D. Balakrishna, son and disciple of Dr. Veena Doreswamy Iyengar.
3. September 27, 1996 - A lecture on "CANCER - SOME MYTHS AND REALITY" by Prof. Gurunath Kilara, Curie Centre of Oncology, St. John's Medical College, Bangalore.
4. October 25, 1996 - A lecture on "INDIAN ECONOMIC REFORMS" by Shri T.N. Ninan, Editor, Business Standard and Business World.
5. November 29, 1996 - A lecture on "HOW CAN INDIA DOUBLE AGRICULTURAL REFORMS" by Dr. P.V. Shenoi, Director, Institute for Social and Economic Change, Bangalore.
6. December 27, 1996 - A lecture on "BIOLOGICAL CLOCKS" by Prof. M.K. Chandrashekhara, Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore.

OTHER SEMINARS / WORKSHOPS HELD AT NIAS

(JULY 1, 1996 TO DECEMBER 31, 1996)

1. August 19-23, 1996 - An International Conference on "Nonlinear Differential Equations and Applications" was held by Tata Institute of Fundamental Research, National Centre of the Government of India for Nuclear Science and Mathematics, Bangalore.
2. September 5-6, 1996 - A two-day Workshop on "Experience of District Planning in Health" was held by the Foundation for Research in Health Systems, Ahmedabad.
3. September 11-14, 1996 - A four-day Seminar on "National Consultation on Media Policy and Radio" was organised by VOICES, Bangalore. Amongst others, there were foreign radio professionals from Peru, Philippines and Srilanka.

The Consultation released the Bangalore Declaration which asserted that deregulation of the airwaves and promotion of community broadcasting at village level was a logical development in the process of decentralised governance initiated by the 73rd and 74th Constitutional Amendments. It should be made possible for universities, cooperatives and public bodies to set up and independently run small low-cost radio stations with participation of village communities in the programming and management.

4. September 27-28, 1996 - A two-day Workshop on "Conservation of Medicinal Plants" for Assistant Conservator of Forests was organised by Foundation for Revitalisation of Local Health Traditions, Bangalore.

REPORT ON DST PROJECT - 'FORMULATION OF CRITERIA FOR EFFECTIVE R&D FUNDING'

**V. Suchitra Mouly, C.V. Sundaram and
Raja Ramanna**

The report to be submitted to the DST on this project has been finalised. As stated earlier, it is composed of 2 volumes, volume 1 presenting the findings in the present study and outlining a strategy for the future, and volume 2 collecting the reports on the various seminars and meetings, field visits and discussions. A chapter (V. Suchitra Mouly and M.G. Narasimhan) on

'The international scenario in S&T funding' has been added; it compares the current approaches and strategies in the United Kingdom and Japan on one side and in New Zealand and Malaysia on the other.

GUEST SPEAKERS

1. August 22, 1996 - A lecture on "In Search of Ethical Professional Conduct" by Dr. Abraham M. George, President and CEO Multinational Computer Models, Inc., an International Financial Consulting and Software Company.
2. November 27, 1996 - A lecture on "An American Perspective on Nuclear Strategy" by Prof. Kenneth N. Waltz, Professor Emeritus, University of California, Berkeley. Prof. Waltz is one of the leading strategic theorists of contemporary times. In his talk, he presented some of the recent changes being made in U.S. policies and explicitly remarked as to why U.S. is against the spread of nuclear weapons. Wars by nuclear weapons cannot be fought because it induces a sense of responsibility. It is really difficult to handle nuclear weapons.
3. December 9, 1996 - A lecture on "Time and Consciousness in Indian Thought" by Dr. Anindita N. Balslev, Senior Advisor, Danish National Institute for Educational Research, Copenhagen, Denmark. She spoke on the various perspectives of time and consciousness taken up by various schools of Indian philosophy. There need to be a critical understanding of the meanings attributed to self-awareness. Dr. Balslev also presented the controversies in Indian thought regarding the cyclic and linear nature of time.

FACULTY LECTURE PROGRAMME

Lectures delivered by various faculty members during the second half of the year are:-

Jul 10, 1996	Psycho-social Factors Influencing the Sexuality of Urban Indian Women - Project proposal for a Pilot Study	Prof. Biswajit Sen
Aug 14, 1996	Study of the Status of Women in Karnataka - Progress and Insights	Ms. Srilatha Battiwala

Sept 11, 1996 (Part - I)	Introduction to Sociology of Science : The classical phase	Dr. M.G.Narasimhan
Sept 13, 1996 (Part - II)	From Sociology of Science to Social epistemology of Science	Dr. M.G.Narasimhan
Nov 27, 1996	An attempt to Build a Knowledge-based System for Epigraphy Text	Dr. H.K. Anasuya Devi

IMPORTANT LECTURES / ADDRESSES / PRESENTATIONS / PUBLICATIONS ETC.

(JULY 1, 1996 - DECEMBER 31, 1996)

DR. RAJA RAMANNA
DIRECTOR

A. LECTURES / ADDRESSES:

1. August 5, 1996 - Chaired Science Session at the seminar on "Science, Technology and Culture in Medieval Age, 10-18th Centuries" organised by the Project of History of Indian Science, Philosophy and Culture at Delhi.
2. September 27, 1996 - Inaugurated the Annual Conference of the Indian Academy of Neurology, organised by Department of Neurology, NIMHANS.
3. September 29, 1996 - Chief Guest in the Inaugural Session at the 4th National Seminar for Science Teachers on "Peaceful Uses of Atomic Energy", sponsored by United Schools International in Collaboration with Department of Atomic Energy held at TIFR, IISc Campus, Bangalore
4. October 11, 1996 - Inaugurated the Maharani Science College Student Association.
5. October 14, 1996 - Spoke at the International Seminar on "Relevance of Nuclear Power - Future of Nuclear Energy" and Launching of Indian Atomic Industrial Forum (IAIF) on "Nuclear Energy - International Perspectives" at Delhi.
6. November 8, 1996 - Delivered a lecture on "Nuclear Energy Problems of the Coming Century" at the Bengal Chamber of Commerce and Industry at Calcutta.

Participated in the Press Conference about the Convention-cum-Exposition "R&D India, 1997" at Calcutta to be organised by the Saha Institute of Nuclear Physics.

7. November 14, 1996 - Inaugurated the Exhibition-cum-festival of the child on Childrens Day Programme organised by the Bishop Cotton Boys' School, Bangalore.
8. November 21, 1996 - Chaired a Session on "Technology Transfer Issues" in the International Seminar on "Nuclear Cooperation: Challenges and Prospects" organised by the National Institute of Advanced Studies, Bangalore.
9. December 2, 1996 - Inaugural address delivered at the National Workshop on "Exploration and Exploitation of Gold Resources of India" at National Geophysical Research Institute, Hyderabad.
10. December 23, 1996 - Inaugurated the Sri Swami Vivekananda Chair at the University of Mysore.

B. PAPERS SENT FOR PUBLICATION:

1. Mass-Time Duality and the Ground State Spins of β -emitting nuclei.
2. The Excited States of Light Nuclei and their relation to Fundamental Particles.

PROF. R.L. KAPUR

A. LECTURES:

1. August 21, 1996 - Delivered a talk on "Creativity" to the MPT participants of the Indian Institute of Management, Bangalore.
2. November 16, 1996 - On the occasion of Prof M.N. Srinivas's eightieth birthday Prof. Kapur spoke on 'The Srinivas I know', at a function arranged by the Institute for Social and Economic Change, Bangalore.
3. December 13, 1996 - Invited as a Chief Guest at the Awards Ceremony for the Graduates of the Kasturba Medical College, Manipal.

B. UNDER PUBLICATION:

1. Creativity in Indian Science. Part One: Review of Literature.
2. Creativity in Indian Science. Part Two: What is Creativity?
3. Creativity in Indian Science. Part Three: The Impact of Culture.

Three papers submitted for publication to the Journal "Psychology and Developing Societies", Allahabad.

PROF. C.V. SUNDARAM
HOMI BHABHA VISITING PROFESSOR

A. LECTURES:

1. July 19, 1996 - Lecture on "Nuclear Industry and Waste Management", I.I.M. Golden Jubilee Lecture, under the auspices of the Bangalore Chapter of the Indian Institute of Metals.
2. August 11, 1996 - Lecture on "Atomic Energy and Applications of Nuclear Radiation", Dr. S.D. Thirumal Rao Memorial Lecture, Oil Technology Research Institute, Anantapur.
3. September 29, 1996 - Lecture on "Nuclear Power: a Global perspective and the Indian Scenario", Key-note Address in the Refresher Course on 'Peaceful Uses of Atomic Energy' for Science Teachers, under the auspices of United Schools organisation and the DAE, Indian Institute of Science campus, Bangalore.
4. October 16, 1996 - Lecture on "Power of the Atom", UGC-JNC sponsored NIAS Course for University and College Teachers, NIAS.
5. October 26, 1996 - Lecture on "Technology Trends in Rare Metal Extraction", in Seminar on 'Emerging Metallurgical Technologies', Delhi Chapter of I.I.M., New Delhi.
6. November 4, 1996 - Lecture on "Atomic Energy - the Early Years", Colloquium at the Indira Gandhi Centre for Atomic Energy Research, Kalpakkam.
7. November 15, 1996 - Lecture on "Fifty Years of Nuclear Materials Development" Golden Jubilee Symposium on 'Fifty Years of Metallurgy: Retrospect and Prospect', Indian Institute of Metals, Vigyan Bhavan, New Delhi.
8. December 15, 1996 - Participation as Chairman and Moderator, at the Seminar on "Science and Religion," Indian Institute of World Culture, Bangalore.

B. PUBLICATIONS:

1. "Technology Trends in Rare Metal Extraction", Proceedings of the Seminar on 'Emerging Metallurgical Technologies', New Delhi Chapter of I.I.M., October 1996.
2. "Rare Metal Metallurgy in the Indian Atomic Energy Programme", Golden Jubilee Souvenir, Indian Institute of Metals, November 1996.

3. "Unclear Criticism?" Article on Safety Management in the Indian Nuclear Energy Programme, contributed to the Hindu, July 18, 1996.
4. Review of "Minerals and Metals in Ancient India", 2 Volumes by Arun Kumar Biswas and Sulekha Biswas, published in Current Science, Vol. 71, No. 7, October 10, 1996 pages 587-588.

PROF. M.N. SRINIVAS
J.R.D. TATA VISITING PROFESSOR

A. LECTURES:

1. July 22, 1996 - Lecture on "The Roots of Indian Pluralism" at the Bharatidasan University, Tiruchi.
2. August 9, 1996 - Chaired the Devaraj Urs Memorial Lecture delivered by Professor James Manor, Director, Institute of Commonwealth Studies, London at the Institute of Development Studies, Mysore University. The subject of the lecture was "The Political Leaders of Karnataka".
3. October 4-9, 1996 - Conducted a course on "Village India" for Medical Students and Faculty at the Manipal Academy of Higher Education, Manipal with the assistance of Dr.(Ms.) A.R. Vasavi and Mr. Shama Bhat.
4. October 9, 1996 - Special Lecture on "What is happening to Caste?", at NIAS for the participants of the Fourth NIAS Course for University/College Teachers.
5. November 27, 1996 - Inaugurated a "Refresher Course on Social and Political Philosophy: Indian and Western" at the Department of Philosophy, Jadavpur University, Calcutta and delivered a lecture on "Participant Observation" on November 28, 1996 as part of the Refresher Course.

PROF. B.V. SREEKANTAN
SENIOR HOMI BHABHA FELLOW

A. LECTURES/ADDRESSES:

1. August 25, 1996 - Valedictory address of the Seminar "Telematics 96" at J.N. Tata Auditorium Complex, Bangalore.
2. November 4, 1996 - Inaugural address on "Radio Activity and Modern Physics" at the Seminar on "Impact of Discovery of Radioactivity on Modern Society" held at Jnana Sahhyadri, Kuvempu University, Shimoga.

3. October 10, 1996 - Lecture entitled "Are there limits to Scientific Explanations?" - Fourth NIAS Course for University/College Teachers.
4. November 18, 1996 - Rajyotsava Extension lecture on "Science and Society in the 21st Century" at Bharatiya Vidya Bhavan, under the auspices of the Institute for Social and Economic Change, Bangalore.
5. December 29, 1996 - Lecture entitled "The Philosophy of Science at the end of the 20th Century" at Madras, under the auspices of the Theosophical Society.
2. September 16-19, 1996 - Keynote address on 'Adult Education as a Tool for Poverty Alleviation and Social Transformation', Asia-Pacific Regional Conference on Adult Education, organised by the Department of Non Formal Education, Ministry of Education, Government of Thailand, Jomtien, Thailand.
3. September 24-26, 1996 WOPRA-DSERT-DPEP Workshop for Assessing Effectiveness of the Gender Component of the Primary Teachers Training Module for DPEP districts, at NIAS.
4. October 13-17, 1996 - Panel presentation on 'Strategies for Improving Government Accountability' at the Workshop on Governance and Civil Society, organised by the LBJ School of Public Affairs, University of Texas and hosted by Getulio Vargas Foundation, Sao Paulo, Brazil.

PROF. BISWAJIT SEN

A. PUBLICATION:

1. "The Indian Anima: Facets of the psyche of the Modern Indian Woman" to be published by Sterling publishers, New Delhi in 1997, as a chapter for a book.

PROF. K. RAMACHANDRA HONORARY VISITING PROFESSOR

A. LECTURE:

1. October 11, 1996 - A lecture in memory of Professor Paul Erdős (March 26, 1913 to September 20, 1996) given at Mathematics Department, Indian Institute of Science, Bangalore.

B. PUBLICATIONS:

1. Problems and Results on p - β q, (Written jointly with A. Sankaranarayanan and K. Srinivas), Acta Arithmetica Vol. 75 (1996).
2. Fractional moments of the Riemann Zeta-Function, (To appear in Acta Arithmetica).
3. A remark on Perron's Formula (Accepted for publication in Journal of the Indian Mathematical Society).

MS. SRILATHA BATLIWALA FELLOW

A. LECTURES / WORKSHOPS / CONFERENCES / TRAINING PROGRAMMES:

1. September 6-12, 1996 - Module Coordinator and Session Moderator on Gender Relations, Women's Empowerment, Construction of Gender, Sexuality, in the MacArthur Foundation - Centre for Development Studies (Trivandrum) training programme on Reproductive Health, Rights, and Women's Empowerment, Trivandrum.

B. PUBLICATION:

1. 'Transforming of Political Culture - the Mahila Samakhya Experience', Economic and Political Weekly, May 25, 1996.

DR. DEEPA M. OLLAPALLY FELLOW

A. LECTURES/PAPERS/WORKSHOPS:

1. July 10, 1996 - Paper on "U.S. Security Policy: The Politics of Power and the Power of Politics", presented at the Institute of Southeast Asian Studies, Singapore.
2. July 11, 1996 - "India's Strategic Relations in Asia", presentation at the Malaysian Strategic Research Centre, Kuala Lumpur, Malaysia.
3. August 29, 1996 - Paper on "Current U.S. Defence Policy Trends and Implications for India", presented at the Centre for American and West European Studies, School of

International Studies, Jawaharlal Nehru University, New Delhi.

4. August 30, 1996 - Paper on "Indian Strategic Policymaking and the Calculation of Costs", for Seminar on India's Strategic policymaking: Looking Beyond the Nuclear Test Ban Issue at Centre for Policy Research, New Delhi.
5. September 30, 1996 - Opening Address, "Evolution of the Global Political Economy Scene", for the Workshop on Globalisation and Liberalization: Challenges for NGOs, Indian Institute of Management, Bangalore.
6. October 12, 1996 - Lecture on "India's Changing Role in the Post Cold War World", for the Fourth NIAS Course on "An Integrated Approach to Knowledge and Information."
7. October 14-November 6, 1996 - "American Foreign Policy", a series of lectures in the Department of Political Science, Bangalore University.

B. PUBLICATIONS

1. "Identity Politics and the International System", Nationalism and Ethnic Politics, United Kingdom, Vol.II, No.4, Winter 1996.
2. "India's Options on the Comprehensive Test Ban Treaty", NIAS report, ISSP (1996-1), co-author with Mr. S. Rajagopal.

C. UNDER PUBLICATION

1. "Foreign Policy and Identity Politics: Realist versus Culturalist Lessons", The Journal of Strategic Studies.
2. "Changing U.S. Arms Exports and the Asian Balance of Power".

DR. P.K. SHETTY RESEARCH FELLOW

A. LECTURES:

1. October 28, 1996 - Lecture on "Pesticide Pollution: Problem and approaches to remediation" at NIAS for the participants of the Fourth NIAS Course for university/college teachers.
2. December 5, 1996 - "Influence of Metalaxyl on carbon dioxide evolution, dehydrogenase and phosphatase activities in the rhizosphere of wheat (*Triticum aestivum* L.)" paper presented at the National Symposium on "Towards green and sustainable pesticides" at New Delhi, December 4-6, 1996.

B. PUBLICATIONS:

1. Influence of Metalaxyl and Pendimethalin on soil phosphatase activity in the Rhizosphere of wheat. *J. Teach.Res. Chem.*, 3(1), 53-59 (1996).
2. Influence of cowpea [*Vigna unguiculata* (L.) walp] cultivars on nodulation and nitrogen fixation in different soil conditions. Proc. of National Symposium on Horticultural Biotechnology (1996), published by Indian Institute of Horticultural Research, Bangalore.

DR. SUNDAR SARUKKAI RESEARCH FELLOW

A. LECTURES:

1. September 27, 1996 - "What is Consciousness" at NIAS.
2. October 14-15, 1996 - "Understanding Reality - From Physics to Postmodernism" at NIAS.
3. October 21, 1996 - 'Postmodernism and Architecture' at the South Zone Architecture Students' Conference, B.M.S. Engineering College, Bangalore.

B. PAPERS - UNDER SUBMISSION:

1. 'Science as Soligarchy - Invited paper in honour of Prof. P.R.K. Rao, IIT, Kanpur.
2. 'The Other in Anthropology and Philosophy'.
3. 'Explaining Consciousness - Some Pointers from the Philosophy of Mathematics'.

DR. S.A. SANGEETHA MENON RESEARCH FELLOW

A. LECTURES:

1. August 24, 1996 - Lecture on "Work Dynamics and Meditation in Bhagavad Gita" at Veda Adhyayana Kendra, Bangalore.
2. October 17, 1996 - Lecture on "The concept of consciousness in Bhagavad Gita" at the Institute for Yoga and Consciousness, Andhra University, Visakhapatnam.
3. October 19, 1996 - Lecture on "An Existential Approach to two levels of consciousness with special reference to Bhagavad Gita Pragmatics" at the Institute for Yoga and Consciousness, Andhra University, Visakhapatnam.
4. October 28, 1996 - Lecture on "The Vedic and Darsana Tradition of Knowledge Communication and Methodology" to the participants of NIAS - UGC Teacher's Course.

5. November 25, 1996 - Lecture on "The Ontological Pragmaticity of Karma in Bhagavad Gita" at the World Philosophers' Meet, Maharashtra Institute of Technology, Poona.
6. December 15, 1996 - Lecture on "Is Philosophy of Religion Scientific?" at the Seminar on 'Science & Religion' organised by Centre for History and Philosophy of Science, Indian Institute of World Culture, Bangalore.

B. SEMINARS / WORKSHOPS:

1. October 17-19, 1996 - Invited Resource Person for the National Conference-cum-Workshop on "Two faces of consciousness" organised by Institute for Yoga & Consciousness and Department of Psychology and Parapsychology, Andhra University, Visakhapatnam.
2. November 24-30, 1996 - Invited to present a paper and participate in the joint International Seminar - 'World Philosopher's Meet - A parliament of Science, Religion and Philosophy, 71st session of Indian Philosophical Congress and Afro-Asian Philosophy Conference' organised by Poona University and Maharashtra Institute of Technology, Poona.

C. UNDER-PUBLICATION:

1. "An existential approach to two levels of consciousness with special reference to Bhagavad Gita pragmatics", Journal of Indian Psychology.
2. "The concepts of Consciousness and Materiality in Bhagavad Gita - Towards a Methodological approach", Eighth Volume of Encyclopedia of Indian Culture, Bharatiya Samskriti Samsad, Calcutta.

**DR. M.G. NARASIMHAN
VISITING ASSOCIATE**

A. LECTURES:

1. June 8, 1996 - Invited talk on "The Influence of Science on Philosophy" at Vedadhyana Kendra, Bangalore.
2. September 11 & 13, 1996 - Two lectures on "Sociology of Science, the classical phase and recent developments" at NIAS.
3. October 3, 1996 - Invited lecture on "Sociology of Science" - at Institute for Socio-Economic Change, Bangalore.

4. October 31, 1996 - Lecture on "Aspects of Scientific Discovery" in the Fourth NIAS Course for Univeristy / College Teachers.

B. SEMINAR:

1. September 2-4, 1996 - Participated in the International Conference on 'Science, The Refreshing River - History of Science and Civilizations', organised by NISTADS, New Delhi, DSF, New Delhi and Maison Des Sciences De L'Homme, Paris.
2. December 15, 1996 - Organised, with Prof. B.V. Subbarayappa, a Seminar on "Science and Religion" under the auspices of Centre for History and Philosophy of Science, Indian Institute of World Culture, Bangalore.

**DR. H.K. ANASUYA DEVI
RESEARCH FELLOW**

**A. LECTURES/TECHNICAL
SESSIONS/INVITED SEMINAR:**

1. August 24, 1996 - One-day Workshop and technical session on "ONYX infinite reality", opening new technological possibilities, organised by Silicon Graphics India, Bangalore.
2. October 31, 1996 - One-day Seminar on "O2 and Origin 200 New Product Release", organised by Silicon Graphics India, Bangalore.
3. November 6, 1996 - One-day Seminar on "Technology Presentation on Ultra-Computing", organised by Sun Microsystems, Bangalore.
4. November 25, 1996 - One-day technical session on "The Origin Series" organised by Silicon Graphics India, Bangalore.

B. CONFERENCE:

1. Presented a technical paper on "Application of Image Processing Software for Epigraphic Studies", at MATLAB Users Conference held during November 19-21, 1996.

C. UNDER PUBLICATION:

Application of Image Processing Software for Epigraphic Studies, submitted for publication to IEEE Transactions on Pattern Recognition and Machine Intelligence.

MS. ANITA GURUMURTHY
RESEARCH ASSOCIATE

**A. LECTURES / WORKSHOPS /
CONFERENCES / TRAINING PROGRAMMES:**

1. June 19-26 and July 8-12, 1996 - Training of Investigators of Mahila Samakhya Karnataka in Bijapur and Raichur districts for data collection for study of Status of Women in Karnataka.
2. August 27-29, 1996 - Training of Investigators for data collection in Kodagu district.
3. September 2, 1996 - Presentation on the Habitat Conference, at Hengasara Hakkinna Sangha, Bangalore.
4. September 13, 1996 - Presentation on "A Framework for Studying Gender Relations and Women's Status" at the MacArthur Foundation - Centre for Development Studies Training Programme on Reproductive Health, Rights and Women's Empowerment.
5. September 24-26, 1996 - WOPRA - DSERT - DPEP Workshop for Assessing Effectiveness of the Gender Component of the Primary Teachers Training Module for DPEP districts, Bangalore.
6. September 29 - October 4, 1996 - Attended the Training Programme for NGOs on 'Globalisation and New Economic Policy', Indian Institute of Management, Bangalore.

MR. ARVIND KUMAR
RESEARCH ASSOCIATE

A. PUBLICATIONS:

1. "U.S. Nuclear Policy," Strategic Analysis (1996).
2. Sri Lankan Army Launches Operation Riviresa II (INFA July 14, 1996).

B. UNDER PUBLICATION

1. "U.S. Strategy: From Containment to Engagement and Enlargement" (United Services Institute Journal).
2. "Indo-U.S. Defence Cooperation" (Indian Defence Review Journal).

**INTERNATIONAL SEMINAR ON
"NUCLEAR CO-OPERATION:
CHALLENGES
AND PROSPECTS" - A REPORT**

The International and Strategic Studies (ISS) Unit of the National Institute of Advanced Studies (NIAS) held an International Seminar on Nuclear Cooperation on November 21-22, 1996. The Seminar was attended by experts from the United States, France, South Korea, Japan, the International Atomic Energy Agency, and scientists and strategic analysts from India. The two-day Seminar highlighted the challenges and prospects for achieving mutual cooperation between the states relating to all aspects of nuclear technology.

The broad themes that the Seminar considered included disarmament and the security link; implementation and verification of non-proliferation regimes; transfer of technology; and nuclear energy development. The Seminar culminated with a Roundtable on Confidence Building Measures. Several viewpoints emerged from the Seminar.

On the question of security and disarmament, Dr. C. Raja Mohan, Strategic Affairs Editor of The Hindu suggested that the attempts being made to thwart India's nuclear programme by the U.S. is not a healthy sign. He noted that for India and United States, the need is instead to pursue practical and realistic approaches to the nuclear question. The normative approaches to the nuclear question so far, will be unable to resolve their differences. He emphasised that since the end of the cold war, the U.S.-backed efforts to cap, reduce over a period of time, and eventually eliminate India's nuclear and missile capabilities need to be revised.

In considering possible technical solutions to proliferation, Dr. Alfred Lecocq, President, EURIWA Foundation in France, claims that several nations have gained a rather good knowledge on Molten Salt Reactor (MSR) alternatives, in spite of the end of Oak Ridge studies on this in 1974. In his view, the threat of proliferation by enrichment of reactor grade plutonium (RPu) may be eliminated by burning this plutonium in MSR.

Mr. Christopher Paine, Senior Research Associate of Natural Resources Defence Council, U.S.A, in his presentation on U.S. Nuclear Stockpile Management Programme, claims that the U.S. spending on nuclear weapons has dropped



International Seminar on "Nuclear Cooperation: Challenges and Prospects"

significantly. The drop is an average of \$ 8 billion per year from 1983-1993 (in constant FY 96 dollars).

On the contrary, spending on nuclear weapons research remains high. The level of expenditure on Stockpile Stewardship Management will remain above the cold war annual average for directly comparable activities (nuclear weapons R&D, testing, production, and stockpile surveillance).

Regarding the issue of technology sharing, Dr. Kasturirangan, Chairman, Indian Space Research Organisation (ISRO) asserted that the greatest challenge to globalisation of science and technology was the continuing concentration of research and development investments. Over the decades, it has been observed that in the industrialised countries, the growth of R&D expenditure was more than the growth rate of GDP.

Dr. R. Chidambaram, Chairman, Atomic Energy Commission considered the question of embargo regimes and its impact. Since 1974, India

has been facing some degree of restrictions on imports of materials and equipment and technology. According to him, the progress which India has made in these 22 years in different sectors of atomic energy, has made clear that the impact on India of such restriction or sanctions has been low.

On nuclear energy developments, Dr. Raja Ramanna asserted that nuclear power was the only option in the future and that India is making slow progress in this area. He stated that thorium conversion to fuel was essential for the power programme. He explicitly noted that India has enough thorium to take care of its energy needs for the next two centuries.

On India's experience in nuclear power, Mr. Y.S.R. Prasad, Managing Director, Nuclear Power Corporation claims that both the old (Tarapur, Rajasthan and Madras) and new generation nuclear power stations (Narora and Kakrapur) have performed very well attaining cumulative life time capacity factor near to normative value and selling power at competitive rates. He also noted

that a beginning has been made for the second phase of nuclear power program with the setting up of a Fast Breeder Test Reactor (FBTR) at Kalpakkam and recent commissioning of a 30 KW research reactor "Kamini" which has Uranium 233 as fuel.

In looking at confidence building measures at the concluding Roundtable, Mr. Jasjit Singh, Director, Institute for Defence Studies and Analyses presented a series of options for building nuclear cooperation focused on Indo-U.S. relations. These included more open trade and investment in nuclear power sector which will require requisite modifications in export control regimes. He also proposed interim measures to be considered such as a strategic arms reduction treaty between India and the five nuclear weapon states.

Dr. Thomas W. Graham of the Rockefeller Foundation suggested that small working groups may be formed to discuss five or six key questions and discover where the commonalities lie and see whether the differences can be bridged. He stressed the fact that after the end of the cold war, a series of changes in both the American foreign and military policy decision-making system and information gathering systems have taken place. He noted that there is an information gap between the more generalist strategic decision makers, policy experts versus regional specialists on Indian strategic thinking, both inside and outside the government. He stressed the need to bridge the gap between them.

Other important speakers included Mr. David Sinden, Special Assistant to the Director General of IAEA who spoke on new safeguard proposals. Dr. Brahma Chellaney, Research Professor, Centre for Policy Research discussed on the Wassenaar Group, the newest export control regime. Mr. Hong Jang-Hee of the Korea Electric Power Corporation and Mr. Takao Fujie, Managing Director, Japan Atomic Power Corporation elaborated on the successful nuclear energy development of South Korea and Japan respectively.

DEFORESTATION : A MAN-MADE CATASTROPHY

NILOTPAL BORTHAKUR

According to the 1993 World Development Report, deforestation is defined as the permanent conversion of forest land to other uses, including

pasture, shifting cultivation, mechanical agriculture, infrastructural development etc. Deforestation is likely to be a major catastrophe in the coming years which has already begun to impinge directly on the environmental health of the earth. Globally, the problem is so severe that in 1990 deforestation claimed 17 million hectares, an area about four times the size of Switzerland.

Ecological disruption, due to forest clearing is a result of a number of causes. Ever increasing human population, inequitable land distribution and the expansion of export agriculture have greatly reduced the cultivable area available for subsistence farming. This has forced many farmers to clear forest area for agricultural purposes. Apart from this, India's 12 million hectares of permanent pastures are vastly inadequate to meet the needs of its 196 million cattle population. By comparison, the cattle country Uruguay has 13 million hectares for 10 million beasts. Moreover, India's common land, crucial to the animals of the poor, has shrunk by about one fourth over the past 40 years. Excessive grazing, therefore, has degraded forest soils and hampered the natural regeneration of forest. In fact, one estimate puts the Western consumption of hardwood exported from Asian forests at 100 million cubic meters.

Growth of consumerism and extensive monoculture is also a major cause of deforestation. As for example, eighteen million hectares of Amazonian forests have been cleared in Brazil to meet the European and American coffee demand. Studies conducted in the Alps show that in monoculture plantation, the root system is at one level unlike in a natural forest, where roots penetrate to varying depths and hold the soils together more firmly.

The lands in high rainfall areas have traditionally been allocated to forestry. Some of these forest lands are used for 2-3 years for agriculture after clear felling and burning a patch of forest. This traditional system, called shifting cultivation, implied that after 2-3 years of cropping the area would be abandoned for 15-20 years in Tripura and 30-40 years in Meghalaya for natural regeneration of forest. However, with the increase in population, the regeneration period reduces to just 2-3 years. As regenerated patches returns to the farmer much earlier, it results in permanent degradation of forest land.

In the name of development, forest lands are also exploited for promotion of industries, installation of hydroelectric projects, construction

of highways etc. The end result of all these activities are very grave. Sardar Sarovar Project envisages an irrigation component for 187 lakh hectares and 1450 MW of power. To achieve this, it will submerge 13,744 to 39,134 hectares of forest and 11,318 hectares of agricultural land. It will also displace of about 67,000 people, the majority of whom are tribals. Apart from the submergence of forest, another environmental problem that has raised its head recently is that of losing forest land for rehabilitation.

In India, fuelwood is estimated to account for 30 per cent of total energy consumption. The working group on Energy Policy in 1979 stated that in the household sector the percentage share of fuelwood in per capita consumption was 68.5 per cent in rural India and 45.5 per cent in urban India. Pilferage from forest filled the gap between the actual consumption and the legitimate production of fuelwood. Pilferage constitutes a cut in excess of the silviculturally permissible limit and led to continued depletion of forest. The excess cut depletes forest and reduces supplies, while the rising population increases demand. This doubly enhanced gap between demand and supply leads to destruction of much more forest. For example, every year Bangalore city consumes 0.4 million tonnes of fuelwood which is equivalent to 5,000 hectares of forests.

Although man himself is the greatest destructive agent, many natural factors like frost, drought, decline in water table, wind etc. also cause forest destruction. Although forest fire plays a significant role in shaping the character and composition of forests, Forest Survey of India figures in 1988 revealed that 51% of the forest area in Assam, 93% in Arunachal Pradesh, 67% in Bihar, 45% in Karnataka, 58% in Uttar Pradesh is subject to repeated annual fire. Similarly, during the Sixth Five Year Plan (1980-85) 17,852 fires were reported affecting an area of 5.7 million hectares.

Rapid disappearance of forest resources due to deforestation has become a great threat to the future of mankind and the human population on earth is facing gradually a number of consequences.

The Union Ministry of Agriculture estimated that India is losing 30 to 50 million tonnes of foodgrains on account of top soil loss. Similarly, in Pakistan, Java and in parts of Central America and West Africa, the negative effects of deforestation have already begun to constrain food production.

Deforestation also aggravates the twin problems of flood and drought. In the north-eastern states heavy deforestation in the catchment areas of the river Brahmaputra results in floods causing loss of human lives and property every year. According to a research study, the great Indian desert is menacingly advancing at the rate of almost one kilometer a year. Thus, India has a new phenomenon of man made desert.

Increasing demand for fuelwood in the urban centres leads to escalating fuelwood prices. Moreover, sharp and continuous increase in the price of fuelwood will increase the illegal extraction of woods.

The role of tropical deforestation in global warming is well known. One hectare of forest area releases 600-500 kg of oxygen and consumes 900 kg carbon-dioxide. Tropical deforestation alone accounts for 20-30 per cent of annual carbon emission world wide. A forest area of 50-500 metre radius brings atmospheric temperature down by 3 to 5 degree celsius.

Conservation of remaining forest depends neither on making more stringent forest laws, nor on strengthening forest protection forces, but on realisation of some fundamental ecological conditions and acting on that realisation. These conditions are:-

- * an environment can be stable, only when it is productive,
- * conservation and management of one bio-productive system cannot be considered in isolation.

Hence, all nations should promote the regeneration of degraded forest lands to increase permanent global forest cover, reduce pressure on natural forests, conserve bio-diversity and thus enable the stabilising of climate. Concerted efforts should be made to prevent the encroachment pressures by providing land security to small and landless farmers through land tenure laws and land reform. Cattle grazing in forest areas should also be regulated with the involvement of community. Moreover, involvement of local people, NGOs and forest department is absolutely necessary for developing forest in degraded forest lands as well as for conserving the existing forests.

(Dr. Nilotpal Borthakur is an Associate Professor, Department of Agricultural Economics, Assam Agricultural University, Jorhat, Assam and a participant of the 4th NIAS Course for University/College Teachers)

GLOBALISATION AND HIGHER EDUCATION: CHALLENGES AND RESPONSIBILITIES

N.R. MADHAVA MENON

Globalisation, the process that inevitably operates all around us is changing the ways we think and react, the way we live, how we communicate etc. This is perhaps the most significant development in the last 50 years after the Second World War. Nationalism and governance of the post are yielding place to universal standards of human rights, trade and governance. Information Revolution and communication technology have made the concept of *Global Village* something of a reality making significant changes in the educational system particularly in higher education. Trends pointing to the wholesale integration of the World's economics, the blending of its social and cultural systems, the unification of the legal regimes and the proliferation of information technologies are illustrative of this transition to a Global Society - Even crimes are being internationalised compelling changes on ways of combating crime through international co-operation.

The question before us is how to manage this transition to a global society so that humanity's long cherished vision for an era of peace and prosperity is realised, while avoiding the nightmare of chaos and destruction which were experienced twice in this century. The question bothers each one of us whether we teach Science or Arts, Commerce or Humanities. After all, higher education is not limited to dissemination of existing knowledge; it should enable the student to understand the structure and development of knowledge itself so that he can be a participant in creativity and the new applications of existing knowledge. This is where higher education is lacking today - the spirit and capacity for creativity or for generation of new knowledge. Does the education system as practised today inhibit enquiry into what we do not know, a culture which is defined as a fundamental duty of every person under Indian Constitution?

Globalisation is not confined to the economic sphere alone. Telecommunication has created a global audience. Transport is creating a global village. The global inter-dependence is increasingly becoming imperative for survival with the existing imbalances in the world economy. We are facing a very critical situation in terms of jobs, quality of

life, sustainable development, cultural integrity and national identity. Competition is the name of the game and survival of the fittest is the principle which seems to determine who get what in world resources. The emerging scenario is at once promising and grim - promising because science and technology seem to have answers for the ills of society like poverty, ill-health and exploitation; grim because the consumer society and the vestiges of imperialist attitudes can deny the fruits of technology to the majority of developing countries in the world unless they pay a heavy price in terms of their independence, integrity and sovereignty. The question is how are we going to respond to the situation so far as higher education in this country is concerned?

The greatest strength of India is in its human resources - which quantitatively and qualitatively are potentially capable of rescuing our society from poverty and squalor however stiff the competitive environment be. But how are we managing this potential at present?

- After nearly 50 years of independence only 52% Indians are literate. Many of our problems at the social and political level are attributable to our inability to give basic education to our people which alone can contribute to development. The *Kerala Model* has been acclaimed by Prof. Galbraith as unique. It is attributable to 95% literacy, whether the issue is population control, health or employment.

- We did manage to develop some centres of excellence in an ocean of mediocrity. But the graduates of these institutions migrate to developed countries.

- Universities function for hardly 100 days a year, thanks to student elections, strikes by teachers, students and karmacharies, and holidays for a variety of occasions. Examinations do not test learning and large scale frauds are practised to dole out degrees and diplomas. The curriculum is not revised for at least two decades in most of the Conventional Universities. No other method than lecturing and note dictation seem to be followed for teaching, whatever be the subject.

We have turned education into industry, thanks to the capitation fee colleges. When seats were sold and the court intervened, vested interests tried every means to defeat fair methods for admission to professional colleges.

Is this the way we are preparing to face the global challenges of competition and survival

based on excellence? Obviously, our survival is dependent upon how we revamp our education system generally and the higher education system in particular in the next few years.

(This is the gist of the inaugural address given by Prof. N.R. Madhava Menon, Director, National Law School of India University for the Fourth NIAS Course for University/College Teachers. Prof. Menon is also a Senior Associate and a member of the Academic Council of NIAS.)

WHAT IS CONSCIOUSNESS?

SANGEETHA MENON

Consciousness is a subtle and basic concept central to the study of human existence. The wide-ranging connotations harboured by the concept of consciousness has been of interest to traditional as well as modern thinkers. As a foundational characteristic of the human being consciousness can be defined and described variously according to different perspectives in understanding, awareness, thinking, insight and creativity. The concept of consciousness is vested with diverse meanings and functions from the religious, ethical and historical realms apart from the philosophical, psychological and scientific standpoints. Religion considers consciousness from a teleological point of view. A religious consciousness implies faith in a supreme power, to bring about a universal consciousness enveloping all particular existent beings. Ethically, consciousness is transcribed into the word conscience. Consciousness has its historical significance too. From an historical and evolutionary perspective, Thomas N. Munson says: "Consciousness is a living reality that we have to think as a movement in which a past is constantly recreated in terms of a projected future. Therefore as a movement, it can be neither securely grounded in something else nor itself absolutized". Consciousness integrates the past experiences of the social system and advances into the future without being relegated into historicity.

In psychology, consciousness is often judged as a process prescribing different mental acts primarily in the conscious, unconscious or subconscious states of the mind. In the words of Kathleen Wilkes, "Consciousness is a term that groups a thoroughly heterogeneous bunch of psychological phenomena." Cognitive sciences identify consciousness as a knowing function. Consciousness is an embarrassment to

functionalistic and computational theories of mind. These theories suggest a casual determinism between human thought and action, which unsatisfactorily explains the freedom of will and spontaneity of consciousness. Reductionists and structuralists define consciousness as a neurological stimuli or behaviouristic response. The materialist theory of consciousness with which behaviourist theories are associated hold that functioning of consciousness is intimately associated with the nervous system and functioning of the brain. D.M. Armstrong assimilates consciousness with a mental state such as is involved in the ability to perceive. Structuralism, which is a recent advancement of behaviourism, holds that consciousness occurs as a consequence of self-monitoring activity in individual nuclear groups throughout the neuraxis and the verbalization of awareness of this process may be related to language centres in the human cerebral cortex. All functionalistic theories have been vehemently criticized since they reduce consciousness into a mere physical function, thereby questioning the very existence of consciousness.

In the history of Western thought, four principal conceptions of consciousness have been elaborated. The first is that of empiricism, the classical British School commenced by Locke and brought to its completion by Hume. They conceive consciousness as a mosaic of sensory data and images derived from the data. Descartes, Leibnitz and Kant insisted on the activity and spontaneity of mind in terms of perception and apperception and thus established the second principal conception of consciousness. The two other conceptions of consciousness are in regard to the phenomenological and existential approaches. Akin to the psychological methodology, phenomenology is also concerned with consciousness in general as well as with specific conscious acts such as perception, memory, reason etc. Phenomenologists dating back to Husserl view consciousness as constituting the essence of a being. Henry Ey defines consciousness as the intermingling of objects, data, lived experiences and the meaning of each constituted reality. Sartre inaugurated the existentialist approach to consciousness when he described consciousness as a plenum of existence and the existence of consciousness coming from consciousness itself.

Integrating phenomenological, existential and behaviouristic approaches to consciousness, there have been recent trends in conceptualizing

consciousness in the name of identity theory. Of the identity theories, C.O. Evans is the proponent of self-identity theory. Accordingly, the concept has application for the reader because it applies in his own case. In this sense we can affirm 'There is consciousness' without prejudging the question whether there is any subject of consciousness to be revealed through its analysis. The Self or Person is considered as the underlying entity possessing both mental and physical attributes. The Person-identity conceptions of consciousness can be traced in the writings of C.R. Bukala, Pratima Bowes etc. In an article Bukala writes: "Consciousness, in our understanding, is one of the aspects of a dynamic subject, in fact, the aspect which is the focal point of a person's identity and experience as a human person." Though Bowes interprets consciousness as prepersonal, it is only a modified or varied version of the personal aspect, and can be accommodated in person identity theories. According to Bowes, consciousness as a primary datum is prepersonal and not personal in the sense that its occurrence is attended by a feeling that it belongs to so and so. Of course, it is not impersonal in the sense that it happens as something detached from all moorings. The very intentional nature of consciousness provides it with an individual character and the presence to itself of consciousness gives it identity.

Though a wide array of theories conceptualizing consciousness are there, the epistemological and the ontological status of consciousness is accepted by almost all systems. Asserting the self-evident nature of consciousness as the subject, Fritjof Capra remarks that consciousness is not that can be derived from or explained in terms of something else. It is a primal fact of existence out of which everything else arises.

The classical systems of Indian thought deal with consciousness epistemologically, ontologically or both. Heterodox systems introduce consciousness to account mind-body relationship. Amongst Orthodox systems, Nyaya-Vaisesika interprets consciousness epistemologically in atomistic terms. Samkhya Yoga brings consciousness to a realm of passive reciprocity. Advaita Vedanta though analyses consciousness from an epistemological perspective gives consciousness more significance ontologically by defining it as the nature of the cogniser's or experiencer's Self.

To the query 'What is consciousness', there can be an infinite answers. But do they suffix to the

sufficiency of definition will be still debatable. May be as the paradox posed by Godel, we are attempting to understand a phenomenon by another phenomenon [mind and its structural formulations] which is not as complex as the former. Do we have to reorient the whole theme of consciousness in a different fashion? Do we have to alter our focus from the supposed content of consciousness to the methodology we adopt? Do we have to have an integrated appraisal of various methodologies and perspectives in approaching consciousness? Does the analyst influence the formation of a definition of consciousness by his behaviour and attitudes? The evasive nature of consciousness becomes more fascinating in not giving us immediate answers to these questions but by beckoning us to have an open mind and sincere search for the nature of man and existence as a whole.

IMPRESSIONS FROM ISTANBUL *A personal account of the HABITAT II Conference on Human Settlements*

ANITA GURUMURTHY

I attended the second United Nations Conference on Human Settlements - HABITAT II held at Istanbul from the 3rd to the 14th of June. HABITAT II attempted to find solutions to the problems of housing, and at a broader level, examine connected issues of land rights, rural-urban linkages, the impact of economic changes on state policy vis-à-vis the poor and marginalised, the significance of local governance, collaborations between state and civil society, and most importantly, solutions which have emerged from local communities to deal with poverty, natural resource crises, urban infrastructure etc., through innovative strategies.

The Istanbul Conference was preceded by several events and processes - conferences, meetings of ministers, research endeavours, and the publication of newsletters by many regional networks such as the Asian Coalition for Housing Rights, in order to build the process towards HABITAT II in as democratic and participatory a way as possible. Some of these processes started years in advance.

THE SETTING:

As the geographical point of confluence of the East and the West, Istanbul seemed like the most appropriate stage for HABITAT II. The city welcomed its international guests to experience

much more than the Conference. The exotic bazaars, the museums, the Bosphorus, the apple tea and cherry juice, the glorious monuments, the extensive range of mouth-watering sea-food, the enthusiastic student community trained to be volunteers for the Conference, and the friendly taxi-men, were enticements in their own right. Information booklets, brochures and maps about Turkey were available to the Conference participants at the inquiry desk of the NGO Forum. The organising committee had gone to great lengths to ensure the smooth functioning of infrastructure.

The Conference however, was not devoid of politics. Turkish human rights groups organised an Alternate Forum to draw attention to violations by the authorities. However, this forum was forced to close down. The Turkish police crushed two non-violent demonstrations held during the Conference against the closing down of the Alternative Forum and to protest against the situation of the Kurds in Turkey.

THE OFFICIAL CONFERENCE & THE HABITAT AGENDA:

Entry into the "Conference Valley", was restricted to those who were registered as participants - from NGOs, from Governments on the official delegations, and the local and the international press. Not all NGOs could however enter Hotel Hilton, the chosen venue for the Government deliberations. NIAS had received official accreditation from the United Nations, and this rare privilege entitled me to observe the deliberations between official delegates.

The Official Conference was an exercise in high-powered semantics. The draft HABITAT Agenda (the text that was to be finalised and adopted by the participating countries by the end of the Conference), was discussed in painstaking detail by the delegates. Delegates took the Chair's permission to comment on the text that had gone through the grinding mill of 3 preparatory conferences for which delegates had met in other countries in the past year. At the preparatory conferences, delegates could table their disagreements and the text that defied a consensus even after considerable discussion, was "bracketed". The final Conference was a time-bound process involving a focused discussion mainly around the contentious issues relegated during the preparatory conferences as "bracketed text"

Although one sometimes wondered if all this wrestling with words was actually going to make a difference to the lives of the poor and the homeless, it was more than abundantly clear that these conferences are the fora where commitments in international cooperation are made. One also realised that the HABITAT document is a basis upon which the Member States can be held accountable by their peoples.

THE NGO FORUM:

The incessant buzz of activities in the parallel NGO Forum venue - issue based workshops, meetings of regional networks and caucuses, exhibitions, non-violent protest marches, etc., were a testimony to the commitment of citizens' groups the world over, to strategise on all issues affecting the quality of life, especially of the poor and powerless. While the Official Conference held the novice who was witnessing an international conference for the first time in sheer awe, participation in the activities of the NGO Forum, was more like an initiation into the techniques required to decode the sophisticated and complex processes of global politics and develop the skills to influence government decisions through lobbying.

Governments allowed NGOs to make interventions from the floor during the negotiations, thus demonstrating the willingness of the UN system and many participating countries to allow for the expression of the stances of NGOs. This space was used by the NGOs with restraint and good judgement. The Indian delegation accepted the invitation of NGO representatives and the Indian press for a dialogue and Mr. A. Sinha, Joint Secretary in the Ministry of Urban Affairs and Employment, met us during the Conference. Asserting that India believes that the right to housing is a basic right, he also stated that it could not therefore become a justiciable right and that the Indian Government was not obligated to provide adequate shelter to everybody under the law, but was only responsible for creating enabling conditions for people to access the right.

THE WORK OF THE WOMEN'S CAUCUS :

There were caucuses galore at Istanbul, an evidence of the imperative for organising as political forces to push the special interests of communities and groups in order to demand rights and gain a fair share of resources. The most visible and well organised of the caucuses was the Women's Caucus, facilitated by the Women's Environment and Development Organisation

(WEDO). The Caucus has been honing its skills in lobbying to promote women's agenda, fine tuning it over the various UN Conferences of the decade, and having mastered the nuances, is now a veteran at lobbying. The performance of the Caucus, at Istanbul as a political interest group deserves to be described as outstanding.

One of the most significant contributions of the Women's Caucus was the line-by-line recommendations on the Bracketed Text of the HABITAT Agenda document. This was an effort to ensure that the negotiations on outstanding issues engender a final document with a gender perspective. These recommendations were complemented by a meticulously drafted Advocacy Chart which functioned as a ready reckoner indicating the previously agreed UN language supporting the Women's Caucus positions on Gender Equality, Human Rights, Economics, Environment & Sustainable Human Settlements, Health, Peace and Implementation and Finance. The Advocacy Chart speaks highly for women's expertise and deep insights in all areas concerning humanity and their eloquence in communicating their perspectives. The global women's movement was determined not to allow Governments to roll back on the commitments they had made to women of their countries through the earlier UN Conferences.

On all days of the Conference, the Women's Caucus deputed women to watch the official negotiations. They held a 45 minute session every morning in the Main Conference Room of the Official Conference where the deputees in turn, reported on the previous day's deliberations. This reporting was tremendously educative because it encapsulated the proceedings of the Official Conference and placed it within a gender perspective. This was followed by the designing of a strategy for the day; crucial paras that were anticipated to come up for discussion in the Conference during the day were highlighted and suggestions were given for lobbying those country delegations that the Caucus knew would be willing to promote women's interests. The Caucus sessions were chaired on different days by women from different regions of the world, which is more than adequate proof of the conscious efforts of key women within the Caucus to recognise the plurality within the global women's movement and acknowledge the unique and region-specific struggles of women.

The Women's Caucus also held a de-briefing at the end of the day; managed to organise the first-ever creche in a UN Conference at the NGO Forum venue; networked and partnered with other Caucuses such as the Environment Caucus, the Child Rights Caucus, etc., sparing no opportunity to represent their interests as well; and facilitated the organising of impromptu meetings and workshops by negotiating with the organising committee. It was like a well-oiled machine functioning at high levels of productivity. I was simply amazed at the infinite energy in the many women I saw and met.

SOME RESULTS OF HABITAT II:

By adopting the final text, the Governments agreed "to protect all people...from forced evictions that are contrary to the law". The Human Rights Caucus which held that Governments are often in complicity with forced evictions and therefore would justify their actions as being legal, felt that the final language was a watered-down version.

The Conference gave a commitment by adopting progressive language in most paras, to make gender equality a goal in human settlements development. However, there was resistance to some women's rights issues from predictable quarters. The Holy See backed by some G-77 countries including Saudi Arabia, UAE, Sudan, Syria, etc., prolonged negotiations for their own political objectives around reproductive and sexual health issues, in the last two days when many other G-77 members holding progressive positions were not present. Finally, the stronger Beijing text was not adopted on these areas, but language from the International Conference on Population and Development found its way into the document. While these debates were going on, another group of delegates from the G-77, were locked in an intense discussion over language relating to finance with the developed countries. The analysis paper that WEDO has prepared about HABITAT II, sums up these parallel processes - the G-77's preoccupation with resources, the regressive positions of some G-77 countries vis-à-vis women's rights, and the developed countries' fixation with human rights as follows: "The debate could be characterised as falling into a classic UN pattern - the developed countries pushing a human rights agenda, developing countries pushing for economic justice, and women and women's rights being used as a bargaining chip."

Despite resistance from the United States, to commit to financial assistance to the developing countries, and the hesitation of other governments to commit resources, the World Bank has tripled its financial assistance to communities engaged in urban projects. The UNDP also has committed \$25 billion to two special initiatives on urban environment, and environment management.

A landmark advance was made by the adoption of consensus language that calls for responsible corporate behaviour. This was the first time in a UN Conference that there was a consensus on the language to demand accountability from transnational corporations. Another breakthrough was in the adoption of text that calls for strengthening legal frameworks to promote socially and environmentally responsible corporate investment in settlements development. These gains were a fallout of the interventions made by the Women's Caucus.

INDIA'S PARTICIPATION:

India has much to be proud of with regard to its presence and participation at the Conference. Eight of the sixteen innovations and initiatives in solving human settlement problems that India had documented and displayed in panels, found place in the first 100 such "Best Practices" that were selected for display at the exhibition venue. One of these - the Self Employed Women's Association (SEWA), qualified for the Best Practices Award conferred upon just 12 among the 100 displays. The acknowledgement by academics, activists, NGOs, community leaders and many others of the leadership role played by our grassroots women in finding solutions to community issues was overwhelming. Presentations made by Indian women on women's access to land, partnerships with local government, community based water and waste management, housing finance and credit, women's strategies for community development etc., drew large audiences and were immensely appreciated. India also had the largest pavilion at the International Trade Fair which was taking place concurrently with the Conference. Indian women were among the task force chairs for the drafting of recommendations on the Bracketed Text of the HABITAT document. In the vital discussions on financial resources that were being argued in a working group, Mr. I. P. Srinivasan, India's Ambassador to Kenya, was the spokesperson for the G-77 countries. India also played an important behind-the-scenes role in ensuring that rural settlements issues are

adequately addressed and appropriately included in the HABITAT document, which was initially tilted in favour of cities and urban issues.

CONCLUDING THOUGHTS:

The learner in me has experienced few learning situations that compare with the fertile ground that HABITAT II was. That it was a conference focusing on human settlements, enabled me to locate women's concerns, their participation as social change agents and the crying need for their empowerment within the larger canvas of community, social change and development. Needless to say, I have come back with a stronger resolve to continue doing my bit. HABITAT II was an opportunity to observe how we shape our own future as an international community - evolving our understanding, rethinking and reformulating notions, creating new language and discovering new people.

(Anita Gurumurthy, Research Associate of the Women's Policy Research & Advocacy Unit, represented NIAS at HABITAT II. She also presented a paper on Women's Strategies for Advocacy at the Asia Women and Shelter Workshop held during the Conference.)

CTBT AND ITS AFTERMATH

**ARVIND KUMAR AND
DEEPA M. OLLAPALLY**

The Comprehensive Test Ban Treaty (CTBT) proposed by India in 1954 had as its goal the elimination of nuclear weapons on a global basis. At the time, it would have been an ideal instrument for nonproliferation of nuclear weapons, both vertical and horizontal. Unfortunately, the CTBT as it stands has deviated from the objectives of the original concept and thus has ironically placed India at odd with it. India wants the CTBT to include a time-bound disarmament plan with commitments from all nuclear weapon states; it wants the CTBT to be a true test ban, including all laboratory tests and experiments on release of nuclear energy.

Despite the fact that India and the United States have argued about the nuclear question for nearly three decades, their differences now look far more irreconcilable in the wake of their recent acrimony over the CTBT. The earlier optimism occasioned by the visit of India's then Prime Minister, P.V. Narasimha Rao to Washington in May 1994, seems to have dissipated. Analysts had

pointed to a successful summit in the sense that both countries issued a joint statement in which they appeared to find a formula to finesse their nuclear divergence. Bill Clinton and Rao pledged that their governments would intensify their cooperative efforts to achieve a CTBT and verifiable ban on the production of fissile material. Since then the CTBT itself seems to have come in between them.

It is generally agreed that the CTBT makes no difference to the 180-odd nuclear weapon states that have already signed the nuclear Non Proliferation Treaty (NPT). Since they have all agreed not to acquire any nuclear weapons or explosive devices, there is no need for them to have another agreement requiring them not to test non-existent nuclear devices. India's decision to block the passage of the CTBT at a Conference on Disarmament (CD) in Geneva and its vote against the Treaty at the United Nations this year have deepened the nuclear divide between India and the United States.

Now, the question arises as to what do the nuclear weapon states (NWS) gain from a CTBT? Among the NWS, the prominent ones to discuss are the US, Russia and China. The United Kingdom tends to follow the U.S. in nuclear matters and does not need any specific discussion. The testing site for the U.K. is in fact located in Nevada, U.S. France, too is in a similar position now. For both the countries i.e., Britain and France, nuclear weapons remain an instrument of international prestige.

In the case of Russia, its interest most likely lies in not engaging in a further nuclear race with the U.S. because of its severe economic problems. It has already experienced the folly of a U.S.-Soviet arms race. In addition, the former Soviet Union was a supporter of a CTBT for a long time so its current position is a consistent one. Russia also gains an important strategic advantage vis-a-vis its rising neighbor China which will be forced to freeze its nuclear development at a lower level.

For China, an immediate ban on testing will put it at a disadvantage. Development of new nuclear weapons would be difficult under a CTBT. If advanced warheads are to be developed, their reliability, credibility, and safety would be adversely affected without testing. The U.S. and Russia have already concluded hundreds of tests and have gathered sufficient data for future computer modelling. The Chinese are yet to fully develop their warhead capabilities. Therefore, a

CTBT would be a hinderance to their modernisation plans. On the other hand, there will be a gap of two or more years between an agreement on a CTBT and its entry into force. That will give them sufficient time to conduct tests and perfect designs. Hence, a CTBT should not really affect them in the short run.

The U.S., like Russia, has economic compulsions in a CTBT. It is important to note that even for the U.S., continuing the nuclear arms race would entail economic costs. Nuclear testing is expensive. Estimates of the marginal cost of a single test range upwards of \$ 50 million, while average costs are estimated at \$ 160 million. While the U.S. can sustain a nuclear arms race in competition with Russia, it is also true that such wasteful public expenditure will adversely affect the U.S. economy and its ability to compete effectively in world markets against East Asian economies, including Japan.

But it is unlikely that economics and any aversion to use of a nuclear weapon alone is what propels the U.S. towards a CTBT. Like Russia, the U.S. views the CTBT as a useful mechanism to check China's nuclear potential. This would explain the U.S. willingness to concede to China's demands for the entry into force provisions in order to bring it on board, even though it had severe negative implications for India.

In the post cold war era, the U.S. is no longer in a position, for a number of political reasons, to unilaterally impose its military will on a wide front. It may therefore, be viewed as seeking to establish international regimes such as the CTBT through which it can produce preferred outcomes.

Another point of view is that the U.S. no longer has a sufficiently compelling politico-military requirement to test when balanced against other important concerns. This view takes issue with the contention that the U.S. supported the CTBT because it no longer requires explosive tests to develop new weapons. However, it should be noted that U.S. will continue to spend 200 million dollars per year to maintain the "readiness" of the Nevada Test Site to resume testing. In addition, the development of a computer based "virtual weapons" design capability for the U.S. will depend on the extent of political and security constraints in the future. Current controls under the CTBT do not provide a fool proof method to detect or eliminate laboratory testing by those who have the capability to do so.

From India's perspective, a nagging concern is the extent to which the CTBT is only one step in a step-by-step process of ultimately discriminatory nuclear disarmament. One positive development is that despite the deep conflict over the CTBT, post CTBT Indo-U.S. relations in economics and security have actually shown no real signs of serious deterioration.

INDIAN ECONOMIC REFORMS

T.N. NINAN

The whole process of liberalisation began in India due to the balance of payment crisis. Indian economy was facing with a large trade deficit and a huge foreign debt. The other important aspect of taking liberalisation measures were the domestic issues which were related to fiscal control and stabilisation. The programme of de-regulating the Indian economy is an experiment in itself. This deregulation process took the form of industrial delicensing, virtually abolishing the monopoly aspect of the MRTP Act. In order to free investments, it took the form of abolishing most of the import controls.

On the external side, the various steps that the Government took in this five year period, was marked by the significant devaluation of the rupee. Due to the dual exchange rate, rupee has been devalued from Rs. 18 to Rs. 36 for a dollar. Another step which the Government took on the external front was the tariff reduction. The Indian import tariffs were by far the highest in the world. The external liquidity of the system has also improved very significantly. Foreign exchange reserves have gone up from less than a billion dollars to \$ 600 m.

The debt ratios are also better. A debt-to-GDP ratio of 50 per cent was a safe upper limit. In the case of India, the debt of \$ 95 billion against the GDP of \$ 350 billion was well within the risk level. The foreign currency reserves had recorded a 'phenomenal increase' from \$ 300 million to \$ 3.5 billion. On the external front, the economy is very much better off today than it was five years ago.

On the question of inflation, the rate of inflation in the Indian economy has been around 8 per cent a year. If this entire period of five years is taken into account, the average rate of inflation is no better than what it was earlier. The reform process has not helped to solve the inflation issue.

Regarding the failures of reforms, it is manifest that the area where the state functions has simply collapsed. In several areas, the policies made by the Government are nebulous. Policymaking has remained a major problem. There is a need to amend important laws, in order to get the economy to function more efficiently.

The real divide in India is not North-South. The real divide is between the East and West. If a perpendicular line is drawn, which runs through Kanpur and if India is seen in these two halves, western and eastern half, 9 of the top 10 cities in the country are west of the line. Economy functions west of the line. It does not function east of the line. Hence, there is a very serious east-west divide in India.

The need is to address the key socio-economic indicators which are health, education, literacy, child expectancy etc. Without these issues being addressed, without the quality of the human material in the system improving dramatically, India may not be able to achieve rates of growth that the East Asian economies have already achieved over the last 10 or 15 years.

The fear psychosis created among masses regarding foreign investments should be looked into. The share of global trade was 2.5 per cent, 50 years ago. It fell to 0.4 per cent in 1990. In the last five years, it has come from 0.4 per cent to 0.6 per cent. It hardly matters who produces as long as it is produced in India and the political control over foreign investment is the vital factor.

(This is gist of a talk delivered as a part of Associates' Programme by Shri. T.N. Ninan, Editor, Business Standard and Business World)

A MYSTERIOUS IMPORTANT INEQUALITY

K. RAMACHANDRA

It has been shown that if m and n are any two positive integers we always have

$$[15^n - m(10^n)]^2 > 64^n \quad (1)$$

provided only that n exceeds a constant C . The mysterious thing is that we are unable to determine any specific value, however large, of C . The result (1) is very deep and is due to K. MAHLER. If we can determine some explicit value of C , the result (1) will play an important role in WARING'S PROBLEM.

VISITS ABROAD

Ms. Srilatha Batliwala:

1. April 5-8, 1996 - Attended the Steering Committee Meeting of DAWN, in Suva, FIJI.
2. September 16-19, 1996 - Attended the Asia-Pacific Regional Conference on Adult Education, hosted by the Department of Non Formal Education, Ministry of Education, Government of Thailand, Jomtien, Thailand.
3. October 13-17, 1996 - Attended the Workshop on Governance and Civil Society, organised by the LBJ School of Public Affairs, University of Texas, and hosted by Getulio Vargas Foundation, Sao Paulo, Brazil.

Dr. Deepa M. Ollapally:

1. July 10, 1996 - Attended a Seminar on "Strategic Policy" at the Institute of Southeast Asian Studies, Singapore and presented a paper on "U.S. Security Policy".
2. July 11, 1996 - Attended a meeting at the Malaysian Strategic Research Centre in Kuala-Lumpur, Malaysia and made a presentation on "India's Strategic Relations in Asia".

Ms. Anita Gurumurthy:

1. May 29 - June 15, 1996 - Attended the UN HABITAT II Conference in Istanbul, Turkey.
2. November 10-15, 1996 - Attended the Workshop on "Violence, Abuse, and Women's Citizenship", organised by the University of Bradford in Brighton, U.K.

Prof. R.L. Kapur:

1. September, 1996 - Visited the Department of Anthropology, University of Montreal, to conduct a workshop on the "Study of Violence".

COUNCIL OF MANAGEMENT AND GENERAL BODY MEETINGS

The Sixteenth meeting of the Council of Management scheduled for the second half of the

year was held at the Institute on November 20, 1996.

This meeting was attended by Dr. Raja Ramanna (Vice- Chairman), Prof. C.N.R. Rao, Prof. G. Padmanabhan Dr. V.S. Arunachalam, Prof. R.L. Kapur and Maj. Gen. M.K. Paul [Retd] (Secretary). Prof. M.N. Srinivas and Prof. B.V. Sreekantan attended the meeting by invitation.

NIAS LIBRARY

NIAS library has added more than 100 books in the last six months in the fields of various research programmes of the Institute. The library has also increased the number of journals. The new subscriptions are Theory and Society, Analysis, Pacific Philosophical Quarterly and Journal of Creative Behaviour.

A forward-looking library such as ours faces the challenges of maintaining a fair balance between print-based and digital information. As a step forward in incorporating new publishing techniques which enable faster information retrieval as well as solve the space problems facing libraries today, a multimedia kit has been acquired for the library. The idea is to have as many reference sources as possible in CD-ROM Version. The library now has access to INTERNET. The computerization of the library catalogue using the CDS/ISIS software is in progress.

THOSE WHO JOINED US

November 15, 1996 - Dr. Anindya Sinha joined as a Research Fellow in the Unit of "Philosophy of Science". He completed his doctorate at the Tata Institute of Fundamental Research, Bombay on the biochemical genetics of carbohydrate metabolism in yeast. Subsequently, he has been working on social relationships in primates. His research in NIAS will focus on social cognition and consciousness in wild bonnet macaques.

**THE PARTICIPANTS WHO ATTENDED THE 4TH NIAS COURSE
ON 'AN INTEGRATED APPROACH TO KNOWLEDGE AND INFORMATION'
FOR UNIVERSITY/COLLEGE TEACHERS**

1. Dr. K. Ravindra Reddy
Lecturer in Geography,
Sri Krishnadevaraya University
Anantapur, Andhra Pradesh
2. Dr. Nilotpal Borthakur
Associate Professor, Agricultural Economics
Assam Agrilcultural University
Jorhat, Assam
3. Dr. Amar Nath Jha
Associate Professor, Management
Birla Institute of Technology
Mesra, Ranchi
4. Dr. Synesio Alfredo Antao
Lecturer in Chemistry
P.C.C.F. College of Arts & Science
Margao, GOA
5. Dr. R.B. Subramanian
Lecturer in Biosciences
Sardar Patel University
Vallabh Vidyanagar, Gujarat
6. Dr. Khalid Majid Fazili
Lecturer in Biochemistry
P.G. Dept. of Biochemistry
The University of Kashmir Hazratbal
Srinagar, J & K.
7. Sri. K. Vasanth Kumar Pai
Senior Lecturer
Dept. of Studies in Industrial Chemistry
Kuvempu University
Shimoga, Karnataka
8. Dr. M.V. Narayanan
Lecturer in English
University of Calicut
Thenhippalam, Kerala
9. Dr. Ghodke Sharad Tukaram
Lecturer in Politics
M.E.S. Abasaheb Garware College
PUNE
10. Dr. (Mrs.) Rucha Ghate
Lecturer in Economics
Nagpur University, Nagpur
11. Dr. (Ms.) P.K. Mishra
Center of Studies in Surnface Science
Sambalpur University, Jyoti Vihar, Orissa
12. Dr. (Ms.) Sandhya Tyagi
Department of Botany
College of Science
M.L. Sukhadia University
Udaipur
13. Dr. Srikumar
Lecturer in Biological Sciences
Pondicherry University
Pondicherry
14. Dr. R. Ravindran
Assistant Professor
Dept. of Communication & Entrepreneurship
Madras Veterinary College, Madras
15. Dr. S.K. Sharma
Senior Lecturer in Economics
Govt. Girls' P.G. College
Ghazipur, U. P.
16. Dr. Paromita Roy
Jagadis Bose National Science
Talent Search, Bidhan Nagar
Calcutta
17. Dr. Madhumita Chattopadhyay
Senior Lecturer
Dept. of Philosophy
Jadavpur University
Calcutta
18. Dr. M. Dasan
Lecturer in English
Calicut University Centre
Kerala
19. Dr. Ksh. Khoidong Singh
Assistant Professor
Dept. of English
Manipur University
Chanchipur, Imphal
20. Dr. Paul Alexander Rego
Senior Lecturer in Economics
Mangalore University
Mangalagangothri

HONOURS AND AWARDS

Prof. M.N. Srinivas has been awarded the M.V. Pylee Award as the "Distinguished Academician of India for the year 1996" by the Cochin University of Science and Technology.

Dr. M.G. Narasimhan received the "Martin Foster Medal" for the best thesis for the year 1994-1995 on August 5, 1996 from the Physical and Mathematical Sciences Division, Indian Institute of Science, Bangalore.

Dr. Raja Ramanna has been honoured with the "Asutosh Mookerjee Memorial Award for 1996-1997" instituted by the Indian Science Congress Association (ISCA), for his outstanding contribution to the advancement of science.

LETTER TO THE EDITOR

Dear Editor,

I am writing to you on behalf of the participants of the 4th NIAS Course for University / College Teachers.

Saying "Thank You" to NIAS would be a gross understatement of what we feel. The expertise and the affection with which this course was conducted has touched us both professionally and personally. We all have realized the importance of an

immaculate administration in its role of ensuring the academic goals of an institution.

The lecture sessions on the whole were stimulating and thought-provoking, and many a times they were carried to our rooms and the dining table. We feel a sense of pride in being associated closely with such stalwarts. The philosophy of dedication in every endeavour has motivated us to feel humble and yet, confident.

This course has got us all thinking in our own ways. We have undergone some extent of behavioural, attitudinal, and professional changes for which we are thankful to NIAS. Most of us have made life-long friends and feel a part of a warm and supportive family.

Please accept our deep appreciation and heartfelt gratitude.

Thanking you,

With warm regards,

PAROMITA ROY

(Dr. Paromita Roy, who attended the Fourth NIAS Course for University/College Teachers is Assistant Director (Academic) at Jagadis Bose National Science Talent Search, Calcutta)

*The NIAS NEWS Wishes its Readers
A Very Happy and Prosperous
Ninety Seven*

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