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8. Palchaudhuri, P. (with Bhattacharya, B. B.) : 'The PMC model systems diagnosis : new properties and algorithms', A. K. Choudhury commemoration Symposium on Circuits, Systems and Computer, University of Calcutta, India, during 21-23 February 1990.
9. Ray, S. (with Nandy, S. C. and Bhattacharya, B. B.) : 'On identification of maximum free rectangle in VLSI layout design', A. K. Choudhury, commemoration Symposium on Circuits, Systems and Computers, University of Calcutta, India, during 21-23 February 1990.
10. Srimani, P. K. (with Sinha, B. P., Bhattacharya, B. B. and Ghose, S.) : 'On some properties of trivalent network graphs', Proc. 23rd Asilomar Conference on Signals, Systems and Computers, San Diego, 989-993, 1989.

#### B. *Theoretical Physics*

1. Bandyopadhyay, P. : 'Quantum Gravity, Torsion and the wave function of the Universe', Int. Conf. of Ind. Asso. of General Relativity and Gravitation, at North Bengal University, in November 1989.
2. ——— : 'Quantum space-time and gravity', Invited talk at Int. Conf. on Supernovo 1987 at BARC, Salt Lake, Calcutta.

#### C. *Fluid Mechanics*

1. Daudspat, B. S. : 'Film cooling on a rotating disk in Models in Mathematics', gave as an invited talk in Calcutta Mathematical Society, in September 1989.
2. ——— : Spin coating : a new approach in CASAMCU', at Calcutta Mathematical Society, in February 1990.
3. Mandal, B. N. : 'Effect of strong vertical vortex on a river bed', at CASAMCO 90, during 14-15 March 1990.
4. Mandal, B. N. : 'On some linear models in water waves' and 'Models in Mathematics', at Calcutta Mathematical Society, Calcutta, during 6-8 September 1989.
5. ——— : 'On the growth of a turnover—a mathematical model'. Workshop on Mathematical Models in Biology at Calcutta Mathematical Society, Calcutta, during 19-24 February, 1990.

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6. ——— : 'Mathematics training'—initiation of the discussion was made at the 'First National Seminar on Mathematics Education and Research', at Indian National Science Congress Auditorium Calcutta, during 25-27 December 1989.
7. ——— : 'A porous wave-maker in a liquid of infinite depth', Proceedings of the Seminar on 65th Birthday Celebration of Professor S. C. Dasgupta, at B. E. College, Calcutta, in December 1988.

*Electronics and Communication Sciences*

1. Banerjee, D. K. (with Deb, S. and Dutta Majumder, D.) : 'Recognising partially occluded objects : the challenge and a simple solution', Proc. 5th Int. Conf. Image Analysis and Processing, Italy, in September 1989.
2. ——— (with Parui, S. K. and Dutta Majumder, D.) : 'Shape-based object recognition', Proc. KBCS-89 Cont., at Bombay, in December 1989.
3. Bose, P. : 'Expert CAD techniques for VLSI logic', Proc. Prof. A. K. Chaudhury Commemoration Symposium on Circuits, Systems and Computers, Calcutta, in February 1990.
4. Chakrabarty, B. (with Dutta Majumder, D.) : 'An application of AI technique to the problem of feature subset selection', presented at the National Conference on Electronic Circuits and Systems, University of Roorkee, in November 1989.
5. Chaudhuri, B. B. (with De, A. K., Ganguli, A. and Das, J.) : 'Algorithm development for the recognition of sodar structures', 5th Int. Symp. on Acoustic Remote Sensing of the Atmosphere and Oceans, organised by Int. Soc. for Acous. Rem. Sensing (ISARS-90) at National Physical Laboratory (NPL), New Delhi, during 6-9 February 1990.
6. Chaudhury, L. (with Chaudhury, S. and Bhattacharya, G. P.) : 'A new approach for representation and use of spatial knowledge', Proc. Prof. A. K. Chaudhury Commemoration Symposium on Circuits, Systems and Computers, Calcutta, in February 1990.
7. Datta, A. K. (with Ganguli, N. R. and Mukherjee, B.) : 'Acoustic-phonetic study of Bengali nasals', Proc. European Conf. on Speech Commun. and Tech., Paris, during 1989.
8. De, A. K. (with Das, J. and Dutta Majumder, D.) : 'Atmospheric irregularities in lower troposphere and their effects on VHF propagation', Proc. National Conf. on Electronic Circuits and Systems (NACONECS-89), at Roorkee, (Tata McGraw-Hill Publishing Co.), 545-547, during 2-4 November 1989.
9. ——— (with Ganguli, A., Dutta Majumder, D. and Das, J.) : 'Sodar structures related to gravity wave perturbations over Calcutta', 5th Int. Symp. Acous. Remote Sensing of the Atmosphere and Oceans, organised by ISARS-90, at NPL, New Delhi, during 6-9 February 1990.
10. Dutta Majumder, D. : 'Neural network modelling for speech and other pattern recognition problems' (invited paper), National Symp. Acous-89, at Calcutta, 49-57, during 14-16 December 1989.

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11. ——— : 'Remote sensing techniques in the study of atmospheric structures and environmental pollution—An integrated approach' (invited talk), 5th Int. Symp. Acous. Remote Sensing of the Atmosphere and Oceans, organised by ISARS-90, at NPL, New Delhi, during 6-9 February 1990.
12. Dutta Majumder, D. : 'Artificial intelligence and expert systems—its role in industrial system development', invited lecture, National Symposium on Electronics and Applications, in 12 September 1989.
13. ——— : 'On KBCS approach in image processing, computer vision and pattern recognition', Proc. KBCS-89 Conf., at Bombay, in December 1989.
14. ——— : 'Pattern Recognition and Speech technology applications' (invited paper) in Workshop on Acoustic, Speech and Signal Processing organised by CEERI, at Delhi, during 15-16 June 1989.
15. ——— : 'Interactive computer graphics and some of its application areas' (invited talk), organised by Institute of Engineers, at Calcutta, in 2 September 1989.
16. ——— : 'Computerized image processing and pattern recognition in public health care system' (Key-note address) in 5th Int. Conference on Biomedical Instrumentation and All India Workshop on Instrumentation, organised by IMIAC, at Calcutta, during 27-29 November, 1989.
17. Ganguli, A. (with De, A. K., Das, J. and Reddy, B. M.) : 'Some correlational aspects of anomalous VHF propagation with observed sodar structures', National Space Science Symposium, at Nagpur University, Nagpur, during 5-9 March 1990.
18. Gupta, A. (with Bagchi, A. and Dutta Majumder, D.) : 'An inference mechanism for visual semantic networks', Proc. Prof. A. K. Chaudhuri Commemoration Symposium on circuits, Systems and Computers, at Calcutta, in February 1990.
19. Kundu, M. K. (with Chaudhuri, B. B.) : 'Thinning of gray scale picture', Proc. NACONECS-89, at University of Roorkee, (TMH publication), 353-355, during 2-4 November 1989.
20. Pal, Amita : 'Optimal thresholds for a class of learning algorithms', National Conference on Electronic Circuits and Systems, University of Roorkee, Roorkee, in November 1989.
21. Ray, S. : 'Experimental comparison of some statistical feature evaluation criteria', Proc. NACONECS-89, University of Roorkee, Roorkee (TMH Publication), 364-366, during 2-4 November 1989.

#### *Geology*

4. Saha, D. : 'Compressional structures in a shallow platform—miogeoclinal sequence within Godavari Valley, Proterozoic-remnants of a collisional suture, or aulacogen, or an intracratonic orogen'? Proceedings 28th International Geological Congress, Washington D. C., in 1989.

#### *Physics*

4. Gupta, A. B. : 'A biophysical study of psoriasis', National Symposium on Biophysics, at Salt Lake, Calcutta, during 20-22 February 1990.

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2. ——— (with Haldar B.) : 'Skin friction : A simple device for measurement', XVIII National Conference of Dermatologists, Venereologists and Leprologists, at Jaipur, during 18-21 January 1990.
3. ——— . 'Hygroscopicity and water-holding capacity of ichthyotic skin', XVIII National Conference of Dermatologists, Venereologists and Leprologists, at Jaipur, during 18-21 January 1990.

Biological Sciences

*Agricultural Sciences*

1. Bagchi, D. K. (with Bandyopadhyay, S. and Maiti, A.) : Issues related to land and water use in Bihar Plateau. *Proc. Nat. Symp. Econ. of Land and Water use*, held 1989, Pune.
2. ——— (with Adhikary, S., Ghosal, P., Bagchi, S. and Banerjee, R. N.) : Studies on increasing cropping intensities under rainfed condition in eastern region of Bihar Plateau. *Int. Symp. Natural Resource Management for a sustainable agriculture*, held during February 1990 in Delhi.

*Anthropometry and Human Genetics*

1. Basu, A. : The method of science : Paradigms in anthropology (Invited paper). *UGC Nat. Sem. Anthrop. : Techniques and Methods*, University of Delhi, December 1989.
2. Das, Ketaki : Haemoglobin levels in individuals with HbE and HbS variance among the Seventeen Populations of Eastern, Central and Western India, *XVII Annual Conf. Ind. Soc. Hum. Genet.*, Madras, 1990.
3. Reddy, B. M. (with Malhotra, K. C., Sengupta, B., Karmakar, B., Vijayakumar, M. and Vasulu, T.) : Age variation in finger ridge count asymmetry. In *Progress and Trends in Dermatoglyphic Research, Proc. Vol. Int. Dermatoglyphics Conf.*, Calcutta.
4. ——— (with Bharati, S. and Malhotra, K. C.) (1990) : Variation in ridge breadth among different dermatoglyphic regions. In *Progress and Trends in Dermatoglyphic Research, Proc. Vol. Int. Dermatoglyphics Conf.*, Calcutta.
5. ——— (with Malhotra, K. C. and Majumder, L.) (1990) : Regional variation in ridge count asymmetry on hand. In *Progress and Trends in Dermatoglyphics Research, Proc. Vol. Int. Dermatoglyphics Conf.*, Calcutta.

*Embryology*

1. P. K. Tapaswi : Order Through Fluctuations in an Epigenetic Model of Transcription and Translation during Embryogenesis, Invited Lecture delivered in Jawaharlal Nehru University, (2-3 March, 1990) in a colloquium on "Realm of Differentiation".

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### Entomology

1. Daschauthhuri, P. C. (1989) : Reflections on certain aspects of the mosquito population in and around Calcutta along with certain observations related to malaria control (invited paper), *ICMR/ICFRI Workshop on Larvivorous Fishes of Inland Ecosystems*, 27-28 September, 1989, New Delhi.

### Leaf Protein

1. Barik, S. (with Matai, S.) : Sugarbeet tops—protein extraction and nutritional evaluation. In : *Proc. 3rd Int. Conf. on Leaf Protein Research (Leaf pro-89)*, Pisa, Perugia, Viterbo, Italy, 1-7 October, 1989.
2. Sengupta, S. (with Matai, S.) : Selection and health status of two communities for a possible acceptance of Leaf Protein (LP) : a pilot study. In : *Proc. 3rd Int. Conf. on Leaf Protein Research (Leaf pro-89)*, Pisa, Perugia, Viterbo, Italy, 1-7 October, 1989.
3. Chanda, S. : Screening of viable and culturable aeromicrobes on brown leaf juice media. In : *Proc. 4th Int. Conf. Aerobiology*, Stockholm, Sweden, 27-31 August, 1990.

### Social Sciences

#### Economic Research

1. Bhattacharya, N. : Some observations on the Data Base for poverty studies. TIES Seminar on *Data Base for Poverty Studies* held in Ahmedabad. 16-17 November 1989, and forthcoming in the Seminar Volume.
2. ——— : Statistical Measurement of Level of Living. *International Seminar Economic Growth in Developing Countries and the Quality of life* held at the Jadavpur University, Calcutta, 13-14 January, 1990.
3. ——— (with Coondoo, D., Maiti, P. and Mukherjee, Robin) : Level of living in Rural India. *17th General Conference of the Indian Association for Research in National Income and Wealth, Calcutta*, 8-10 February, 1990.
4. Dasgupta, D. : Macroeconomics of Price Controls : *International Seminar on Economic Growth in Developing Countries and the "Quality of Life"* held at the Jadavpur University, Calcutta, 13-14 January, 1990.
5. Majumdar, K. : An alternative Methodology of Measuring Inter-State Disparity in Per capita State Domestic Product. *17th General Conference of Indian Association for Research in National Income and Wealth, Calcutta*, 8-10 February, 1990.
6. Roy, B. : Economic Problems of Sundarban. *Bangiya Arthanity Parishad. Burdwan University*, 17-18 February, 1990.
7. Sengupta, A. : Alternative Estimates of Factor Intensity and Net Saving (cost) and Factors : Some Results for Indian Economy. Accepted for presentation in the *Ninth International Input Conference* held at Keztheley (Hungary) during 2-6 September 1989.

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*Planning (Delhi)*

1. Bhat, L. S. : District Planning—concept and techniques : *Proc. National Seminar on District Planning* organised by the Indian Institute of Management, Bangalore.
2. Juyal, C. : Methodology for nutritional status surveys in India. *Proc. International Statistical Institute.*
3. Mookherjee, Dilip : Presented Towards a Theory of Decentralized Decision Making. *International Conference on Developing Countries and the Quality of Life*, Jadavpur University, January, 1990.
4. ——— : Presented The Economics of Enforcement, *Annual Conference on Development of the Indian Economy*, Centre for Economic Studies, Presidency College, Calcutta, February, 1990.
5. Mukherji, Partha, N. : Agrarian Mobilisations and the Analysis of Rural Power : A Framework with B. B. Sahoo. *National Seminar on Emergence of Organised Peasani Power*, Deptt. of Political Science, Punjab University.
6. ——— : Class and Ethnic Movements : Democracy and National Building in India. *International Conference on When does Democracy Make Sense Political Economy and Political Rights in the Third World with some European Comparisious* Uppsala, Sweden 26-28 October, 1989.
7. Saluja, M. R. (with Sarma Atul) : Economic Structure of A Least and the Most Developed Region of India : A Comparative Study in an Input-Output Framework. *IXth International Conference on Input-Output Techniques* held in Kezesthely, Hungary through September 4-9, 1989.
8. Sarma, Atul : Economic Structure of a Least and the Most Developed Regions of India : A Comparative Study in an Input-Output Framework. *IXth International Conference on Input-Output Techniques* held at Kezesthely (Hungary during September 4-9, 1989.
9. Sharma, R. N. : National Capital Region—A concept of reality, *12th Indian Geography Congress* organised through National Association of Geographers of India by Delhi University, 3rd to 5th October, 1989.
10. ——— (with Mishra, G. K.) : Organisation of the Urban Poor, *12th Indian Geography Congress* organised through National Association of Geographers of India by Delhi University, 3rd to 5th October, 1989.
11. Sharma, R. N. : Growth of Metropolis during process and Rapid Urbanisation, *12th Indian Geography Congress* organised through National Association of Geographers of India by Delhi University, 3rd to 5th October, 1989.

*Economic Analysis (Bangalore)*

1. Iyengar, N. S. (with N. S. Manjula Sharada) : A Test for Expenditure Elasticity Estimates from Survey Data. *Twenty-sixth Indian Econometric Conference*, Aligarh, January, 4-6, 1990.



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### *Linguistic*

1. Mitter, Alokannanda : Problems of Translation. *National Seminar of the Institute for Experimental Phonetics and Speech Pathology (IEPSP)*, Belgrade, to commemorate its 40th Anniversary, 14-15 December, 1989.
2. ——— : Collaboration between the Indian Statistical Institute and the Institute for Experimental Phonetics and Speech Pathology, Belgrade. *National Seminar of the IEPSP*, Belgrade, to commemorate its 40th Anniversary, 14-15 December, 1989.
3. ——— (on behalf of Prof. Djordje Kostic) : Problems of Speech Habilitation of Group I children. Special pre-conference *Seminar on SAFA Annual Conference of the Indian Speech and Hearing Association (ISHA)*, 8-9 February, 1990.
4. ——— : The Calcutta Experience. Special pre-conference *Seminar on SAFA Annual Conference of ISHA*, 8-9 February, 1990.

### *Psychometry*

1. Ghosh, A. : Self-Description Inventory as a predictor of managerial success. *27th Annual Conference of the Indian Academy of Applied Psychology*, Aligarh, January 1990.
2. ——— : Managerial skill in different job levels of managers. *77th session of Indian Science Congress*, Cochin, February 1990.
3. Gupta, R. : Effect of Prolonged Deprivation on the School performance, Achievement related response and Intelligence. *77th session of Indian Science Congress*, Cochin, February, 1990.

### *Sociology*

1. Bandyopadhyay, S. : Some observations on resource development : Five Year Plan allocation as a case study. *Seminar on Economics of Land and Water-Resources in India*, Pune, 22-24 July 1989.
2. ——— : Problems of self-sustained agriculture : Observations on rain-fed farming in eastern India. *Workshop on the Evaluation of Social Development Project and Programmes in the Third World*, Swansea, Wales, United Kingdom, 19-21 September, 1989.
3. ——— (with Maiti, A. K. and Bagchi, D. K.) : Resource management in farming by tribals—A case study in eastern plateau of Bihar. *International Symposium on Natural Resources Management for a Sustainable Agriculture*. 6-10 February 1990, New Delhi (sponsored by the Indian Society of Agronomy and IARI).
4. ——— (with Maiti, A. K. and Bagchi, D. K.) : Agro-sociological constraints of technological adaptation in subsistence farming system of plateau region. *International Symposium on Natural Resources Management for a Sustainable Agriculture*, 6-10 February 1990, New Delhi.
5. ——— (with Maiti, A. K. and Bagchi, D. K.) : Problems of risk management in eastern plateau region : Farmers' perception, *International Symposium on Natural Resources Management for a Sustainable Agriculture*, 6-10 February 1990, New Delhi (Sponsored by the Indian Society of Agronomy and IARI).

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6. Chakrabarti, P. : Multi-structural development with social justice. *Workshop on Rural Development*, Harop, Bagnan, February 17-18, 1990.
7. Dasgupta, A. K. : The Fakir and Sannyast uprisings and the Bengal Famine of 1769-70. *National Seminar at Visva-Bharati, 18th century in Indian history : A period of decay or gestation*, February 1990.
8. ——— : The influence of religion : A historical profile of conflict and convergence in Bengal. UGC sponsored Refreshers' Course for college teachers in Sociology and Political Science at Burdwan University, March 1990.
9. Ghosh, T. N. : Abstract of Social legislation—Some expectations and realities, *Proc. Conference of the Indian Anthropological Society*, January 30-31, 1990, Calcutta.
10. Maiti, A. K. : Observations of Land and Water-Resource Management in India, Seminar on *Economics of Land and Water-Resources* in India, Pune, 23-24 July 1989.

Statistical Quality Control and Operations Research

1. Anand, K. N. (with others) : Evolving company cultural change through Quality Programme—An Indian Experience. *Asian Congress on Quality and Reliability (ACQR)*, 1989, New Delhi.
2. Chaudhuri, A. K. : Optimisation of concrete Mix Design. *National Seminar on Quality and Reliability (NIQR)*, 1990, Trivandrum.
3. ——— (with Perumallu, P. K.) : Improving Product Quality through Development of Process Specifications. *33rd EOQC Annual Conference*.
4. Chowdhury, K. K. : Reducing Rework in Wave soldering through Process Optimisation. *ACQR*, 1989, New Delhi.
5. ——— (with others) : Improvement in Hydraulic Pump Efficiency through Parameter Design and Tolerance Design. *ACQR*, 1989, New Delhi.
6. ——— (with others) : Study on High Temperature carburising. *ACQR*, 1989, New Delhi.
7. Chakraborty, S. C. : Systematic Approach for Solving Quality Problem, Transaction. *43rd Quality Congress, ASQC*, 1989.
8. ——— : Total Quality Management—the Challenge and Task Ahead. Biennial Defence Quality Assurance Conference, 1989, New Delhi.
9. Ghosh, D. T. : A near Optimum Continuous Sampling Plan CSP-2 ( $k=1$ ) to Minimise the Amount of Inspection for a given Distribution of Incoming Quality. *ACQR*, 1989, New Delhi.
10. Ibrahim, S. Md. : Robust Design—A Cost Effective Method for Improving Manufacturing Process. *ACQR*, 1989, New Delhi.
11. Majumdar, A. (with Chakraborty, A.) : Developing Optimal formulation for a paint Mixture Problem—an Experience. *Regional Conference on Operations Research ORSI*, 1989.

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12. Mukherjee, S. P. : On Optimum Investment in Drilling out of Return from Mining. *National Conference on Scholastic Model in Management Science*, IIM, 1990, Ahmedabad.
13. ——— : Determination of Efficiency Index through Cost Approach. *ACQR*, 1989, New Delhi.
14. Murali Rao, G. : Zero Quantity Control System. *ACQR*, 1989, New Delhi.
15. ——— : Industrial Experiments : A scientific approach. *ACQR*, 1989, New Delhi.
16. Narayana Iyer, V. : Modern QC concept—From Precept to Practice. *ACQR*, 1989, New Delhi.
17. Nankana, A. N. : Inspection and Quality Control. *Biennial Defence Quality Assurance Conference*, 1989, New Delhi.
18. ——— : A 14-Lever Key for Progress and Development. *ACQR*, 1989, New Delhi.
19. Pandey, R. J. : Training and Education in Quality Control for Small Scale Units. *ACQR*, 1989, New Delhi.
20. Perumallu, P. K. (with others) : Process Optimisation through Orthogonal Array Experimentation. *ACQR*, 1989, New Delhi.
21. ——— : Rating of crimping Tools. *ACQR*, 1989, New Delhi.
22. Rajendra Prasad, V. (with others) : A Heuristic Approach to Optimal Assignment of Components to Parallel Series Reliability System. *ACQR*, 1989, New Delhi.
23. Ramachandradu, B. (with others) : Experimental Designs to Optimise Reaction Parameters of a Complex Chemical Reaction, *ACQR*, 1989, New Delhi.
24. Ranga Rao, N. T. V. (with Venkatesan, A. N. and Verma, S. K.) : Impact of Quality Management Programme on Practicing Professionals. *ACQR*, 1989, New Delhi.
25. Rao, R. A. : Beta Correlation Factor—A New Method for process control. *ACQR*, 1989, New Delhi.
26. Roy Choudhury, A. (with others) . Minimising Rework Coils Used in HV Rotating Machines. *ACQR*, 1989, New Delhi.
27. ——— : Process Development—A Step towards TQC. *44th Annual Quality Congress of American Society for Quality Control*, 1990.
28. Setty, C. A. : Weaving QC circles into Company Wide Quality Control. *ACQR*, 1989, New Delhi.
29. Seth, A. : Statistical Approach to Experimentation. *Biennial Defence Quality Assurance Conference*, 1989, New Delhi.
30. ——— : Trim loss Problem with Lex. Max. Objective Function, Workshop on cutting packaging problem, Greece, 1990.
31. Subhani, S. N. (with Sarkar, N. R.) : Reduction of losses Through Quality Control Tools—Some cases. *ACQR*, 1989, New Delhi.

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Library, Documentation and Information Sciences

1. Devadason, F. J. : Trends in information user's study (Invited paper). *Seminar on Information User Study*, Bangkok, Thailand (under the auspicious of Asian Institute of Technology); November 1989.
2. Gopinath, M. A. : Hierarchical representation and its impact on communication. *Seminar on visual communication of information*, Mysore; June 1989.
3. ——— : Development of specialized library services for women in cities and rural areas (Keynote address). *Seminar on Library services for women*, Mangalore; January 1990.
4. ——— : Programmes for development of Library services for women (Concluding address). *Seminar on Library services for women*, Mangalore; January 1990.
5. ——— : Thesaurus construction. *Thesaurus for Information Retrieval*, New Delhi; March 1990.
6. Ravichandra Rao, I. K. : Journal productivity in economics. *Ind international conference on informetrics*, University of Western Ontario, London, Canada; July 1989.
7. Seetarama, S. : Planning of biomedical information service activities. *Regional Seminar on biomedical library and information system*, Bangalore; June 1989.
8. ——— : Information systems and their inter connection. *Workshop on development information* (held under the auspicious of ADIPA, Kaula Lumpur and the Institute of Public Enterprises), Hyderabad; July 1989.
9. ——— : Planning of college libraries. *Refresher seminar for college librarians*, Pondichery University; January 1990.
10. Meera, B. M. : Cost-benefit analysis of research support services from libraries : a case study of a small academic library, DRTC Annual Seminar, 24, 1990, Paper CE.

PROJECT REPORT SUBMITTED

Applied Statistics, Surveys and Computing

The project "Impact of common oral antidiabetic drug at the protein and immunoglobulin levels of maturity onset diabetic people" has been completed in March, 1990. The report has been submitted. Salient results are as follows :

(i) The effect of a short term treatment with the drug Chlorpropamide on the immunoglobulin fraction, IgM was strong. There was an elevation of IgM fraction but the globulin fraction remained stationary. It was concluded that the new protein fractions generated, were not antibody precursors.

(ii) The data were used to prepare mathematical models of human glucoregulatory functions to have a close insight into glucose homeostatic mechanism.

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### Social Sciences

#### *Sociology*

1. Bandyopadhyay, S., Bagchi, D. K., Maiti, A. K., Md. Quasim, Md. S. Ansari, Sunil Roy, Salil K. Chatterjee and Adhikari, Sujit : "Rainfed agriculture in South Bihar plantaeu region : An exploratory report on cropping pattern in three tribal villages", 130 pages, cyclostyled at ISI Giridih.
2. Chakrabarti, P. : Role of values in career selection, 40 pages, typed at SRU, ISI, Calcutta.

### TECHNICAL REPORTS

#### Theoretical Statistics and Mathematics

##### *Calcutta*

1. Bagchi, B. : A geometric characterisation of Miquelian inversive planes of even order. Tech. Report No. 18/89.
2. Barua, Raha : The Housdorff-Kuratowski hierarchy of  $W$ -regular languages and a hierarchy of Muller automata. Tech. Rep. No. 2/90.
3. Barua, Raha : A separation theorem for  $\omega$ -regular language. Tech. Rep. No. 12/89.
4. ——— : On generalised automata. Tech. Rep. No. 17/89.
5. Bhandari, S. K. : A note on the solution of Linnik's unlinking problem for convex functions. Tech. Rep. No. 15/89.
6. ——— (with Das Gupta, S.) : Unlinking theorem for symmetric convex functions. Tech. Rep. No. 21/89.
7. Chandra, T. K. : A note on lower bounds of large deviation probabilities. Tech. Rep. No. 9/89.
8. ——— (with Goswami, A.) : Cesaro uniform integrability and the strong of large numbers. Tech. Rep. No. 23/89.
9. ——— : Cesaro uniform integrability and extensions of Rajchman's strong law of large numbers. Tech. Rep. No. 24/89.
10. ——— (with Mukherjee, R.) : Bartlett-type-modification for Rao's efficient score statistics. Tech. Rep. No. 26/89.
11. Das, Ashish (with Dey, A.) : On the  $E$ -optimality of some block designs. Tech. Rep. No. 6/89.
12. ——— (with Dey, A.) : Optimal variance and efficiency-balanced designs for one- and two-way elimination of heterogeneity. Tech. Rep. No. 11/89.
13. ——— (with Dey, A.) : A note on  $E$ -optimality of block designs. Tech. Rep. No. 28/89.

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14. ——— (with Gupte, V. K. and Kisan, Praggya) :  $E$ -optimal block designs under heteroscedastic model. Tech. Rep. No. 1/90.
15. Goswami, A. (with Rao, B. V.) : On filtrations of Brownian polynomial. Tech. Rep. No. 27/89.
16. Kundu, S. : On a topology of the set of bounded tight contents. Tech. Rep. No. 6/90.
17. Nag, S. (with Sullivan, Dennis P.) : On conformal welding homeomorphisms associated to Jordan. Tech. Rep. No. 10/89.
18. Purkayastha, S. : A rotationally symmetric directional distribution : obtained through maximum likelihood characterization. Tech. Rep. No. 4/89.
19. Raha, A. B. : Dini's theorem and associated topological properties. Tech. Rep. No. 8/89.
20. ——— : Comment on a theorem of Scott and Watson. Tech. Rep. No. 4/90.
21. Sarbadhikari, H. (with Srivastava, S. M.) : Random fixed point theorems with domain measurable multifunctions. Tech. Rep. No. 7/89.
22. ——— (with Srivastava, S. M.) : Random extension theorems. Tech. Rep. No. 25/89.
23. Sinha, B. K. (with Roy, Dilip) : Characterization of Probability laws using paired comparison models. Tech. Rep. No. 3/90.
24. Tiwari, A. : Parametric homotopy principle for a class of partial differential relations on closed manifolds. Tech. Rep. No. 14/89.
25. ——— : On the existence of contact forms on closed manifolds. Tech. Rep. No. 22/89.
26. Tripathi, T. P. (with Das, A. K.) : Use of auxiliary information in estimating the coefficient of variation. Tech. Rep. No. 20/89.
27. ——— (with Khattree, Ravindra) : Simultaneous estimation of several means. Tech. Rep. No. 13/89.
28. ——— (with Khattree, Ravindra) : Estimation of a parameter using Pitman nearness criterion. Tech. Rep. No. 16/89.
29. ——— : Optimum estimation of mean vector for dynamic populations. Tech. Rep. No. 19/89.
30. ——— (with Mir, A. H.) : Estimation of population mean on second occasion using double sampling for PPS estimation and multivariate auxiliary information. Tech. Rep. No. 5/90.

*Bangalore*

1. Joshi, S. N. (with Ghosh, J. K.) : On asymptotic distribution of an estimate of change point in a failure rate.
2. Rao, T. S. S. R. K. : A  $w^*$ -Radon Nikodym theorem for Banach spaces.

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### Applied Statistics, Surveys and Computing

1. Sarkar, Samir Kumar (with Ganguly, Sukumar) : A study of malnutrition on young insulin dependent diabetes (IDDM) No. ASC/89/11, Sept. 1989. 1-9.

### The Computer and Statistical Service Centre (CSSC)

1. Nandy, Subhas (with Dhar, D. and Mukhopadhyay, A. C.) : Estimation of Parameters of a Parallel System under Random Censoring—II. Cyclostyled.

### Physical and Earth Sciences

#### Electronics

#### A. Digital Systems Research

1. Das, N. (with Bhattacharya, B. B. and Duttgupta, J.) (1989) : A study of conflict graphs and optimal routing in inter-connection networks. Tech. Report No. P & E/E/002/89.
2. Ganguly, A. K. (with Sur-Kolay, S. and Bhattacharya, B. B.) (1989) : Interactive tools for transforming nonslicable VLSI floorplans to slicible layout. Tech. Report No. P & E/E/VLA12/89.
3. Mukherjee, S. (with Bhattacharya, B. B.) (1989) : Design of DCVS VISL logic circuit using binary decision graphs and supergate partitioning. Tech. Report No. P & E/E/VLS11/89.
4. Ray, S. (with Nandy, S. C. and Bhattacharya, B. B.) (1989) : On identification of maximum free rectangle in VLSI layout design. Tech. Report No. P & E/E/001/90.
5. Sur-Kolay, S. (with Bhattacharya, B. B.) (1989) : Family of inherently nonslicable floorplans. Tech. Report No. P & E/E/VLS13/89.

#### B. Fluid Mechanics

1. Mandal, B. N. (1989) : Effect of strong vertical vortex on river bed. Tech. Report No. P & E/E-02/90.
2. ——— (1989) : Report of Nehru Centenary Seminar on Mathematics Education and Research in India. 22 pages, printed.
3. ——— (1989) : A report on First National Seminar on Mathematics Education and Research. 72 pages, printed.

#### Geology

1. Chakraborty, T. (with Ghosh, A. and Kundu, R.) (1989) : Effect of strong vertical vortices on river beds. Tech. Report No. P & E-02/90.

### Biological Sciences

#### Agricultural Science

1. Adhikary, S. (with Ghosal, P. and Bagchi, D. K.) (1989) : Studies on alternate choice of crops and cropping system in plateau upland under rainfed condition. I.S.I. Tech. Report No. AG/104/TR/1/89, September 1989.

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*Anthropometry and Human Genetics*

2. Dasgupta, I. (with Dasgupta, P. and Daschowdhury, A. B.) (1990): Familial resemblance in stature and weight in an endogamous Mahisya caste population of rural West Bengal, Cyclostyled.
3. Pakrasi, K. B. (with Dasgupta, P. and Dasgupta, I.) (1990) : Height and weight of healthy Bengali boys, Cyclostyled.

Social Sciences

*Economic Research*

1. Chattopadhyay, M. (with Mukherjee, R. and Rudra, A.) : Inter and Intra Occupational Differences in Income and Level of Living : IV. Tech. Report No. 3/89.
2. Coondoo, Dipankor : A Linear Fiscal Scheme for Income Redistribution. Tech. Report No. 5/89.
3. Dasgupta, Dipankar (with Misra, Meenakshi) : A Diagrammatic Exposition of Disequilibrium Theory, Tech. Report No. 6/89.
4. ——— : Administered Prices and Deficit Financing : A Macro View. Tech. Report No. 7/89.
5. ——— : The Macroeconomics of Price Controls. Tech. Report No. 1/90.
6. Neogi, Chiranjib : Structural Changes of Indian Corporate Sector. A Quantitative Analysis : 1951 to 1980. Tech. Report No. 11/89.
7. Sarkar, Abhirup : Modernization, Employment and Foreign Borrowing. Tech. Report No. 4/89.
8. Sarkar, Abhirup (with Ghosh, Malabika) : A Model of Informal Sector. Tech. Report No. 12/89.
9. Sengupta, A. K. : Alternative Estimates of Factor Intensity and net Saving (cost) of factors : Some Results for Indian Economy. Tech. Report No. 8/89.
10. Sengupta, A. K. : Some Simulation Results with Input-output Allocation Model. Tech. Report No. 9/89.
11. Sengupta, A. K. : Some Further evidences on the factor content of Indian Trade. Tech. Report No. 10/89.

*Planning (Delhi)*

1. Bhat, L. S. : Status report on Land Systems Analysis for resource development at the Micro-Level, prepared for Department of Science and Technology, New Delhi.
2. Saluja, M. R. : Perspective Plan for Punjab, July 1989 Jointly with a team from National Council of Applied Economic Research.
3. ——— : The structure of Assam's Economy (1982-83) February, 1990 Jointly with a team consisting of Srinath Barua and Atul Sarma.



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4. Kansal, S. M. : Completed the first phase of the ISI—funded Research Project on the Disparity in Income and Level of Living within and Between various occupation groups in Delhi Region, Tech. Report No. 9002.

#### *Sociology*

1. Bandyopadhyay, S. (with Bagchi, D. K., Maiti, A. K., Md. Quasin, Md. Ansari, S. Roy, Sunil, Chatterjee, Salil K. and Adhikari, Sujit) : Rainfed agriculture in south Bihar plateau region : An exploratory report on cropping pattern in three tribal villages. (Cyclostyled)
2. ——— : Issues relating to land and water use in Bihar plateau.
3. Chakrabarti, P. : Role of values in career selection.
4. Chakrabarti, Subhendu : Concept and method of ascertaining assets among rural households.
5. Chatterjee, Arun Kr. (with Rao, A. R. and Bandyopadhyay, S.) : Relative importance of different factors for boundary of reciprocity : An illustration.
6. Maiti, A. K. : Other Indians : A review. (Cyclostyled).

#### *Economic Analysis (Bangalore)*

1. Narayana, M. R. : Economic Determinants of India's Inter-State Workers Migration : Some New Evidence Based on a Polytomous Logit Model. (EAU Working Paper).
2. Iyengar, N. S. (with Anuradha, M. A.) : A Note on the distribution of Salaries : A Case Study. (EAU Working Paper).

#### *Statistical Quality Control*

1. Majumdar, A. : A simple Test Procedure for Estimating the Linear Relationship between Variables Observable under Destructive Testing, Tech. Report SQC-OR No. 7/89.

#### *Library, Documentation and Information Sciences*

1. Bhattacharyya, G. : Development of manpower for modern technology-based information work and service (Technical report prepared as the working document for the UGC TASK group on manpower development for library and information science, held at UGC building Delhi on 5 January, 1990, 11 pages).

#### 6. PH.D./D.S.C. DEGREES

##### 1. *Ph.D./D.Sc. Degrees Awarded*

The following is the list of Ph.D. degrees obtained by the Research Fellows, Research Associates and Project Assistants of the Institute.

1. Sm. Atasi Basu : "On sequential test procedures with applications in identification and selection", degree awarded by the Indian Statistical Institute.  
*Supervisor* : Professor J. K. Ghosh

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2. Sm. Mausemi Bose (nee Sen) : "Applications of calculus for factorial arrangements and allied topics", degree awarded by the Indian Statistical Institute.  
*Supervisor* : Professor R. Mukherjee
3. Shri Rabindra Nath Mukhopadhyay : "An Analysis on Spatial Patterns and Growth of Indian Agricultural Activities : A Study on the Spatial Variations in Agricultural Situation by District-group, 1960-61 to 1980-81", degree awarded by the Indian Statistical Institute.  
*Supervisor* : Professor M. N. Pal
4. Shri Jagabandhu Saha : "A Contribution to Inventory Theory", degree awarded by the Indian Statistical Institute.  
*Supervisor* : Professor S. Bose
5. Shri P. Gajapathi : "The Economics of Ricardo : A Reworking", degree awarded by the Indian Statistical Institute.  
*Supervisor* : Professor S. Bose

The following is the list of Ph.D. degree obtained by the members of the staff of the Institute.

**Computer Science Unit**

1. Shri Pabitra Pal Chowdhury : "A Study on the Design of Self Diagnosable Systems", degree awarded by the University of Calcutta.  
*Supervisor* : Late Professor A. K. Chowdhury

**Embryology Unit**

2. Shri A. K. Sasa : "Mathematical Models of Biological Morphogenesis and Pattern Formation", degree awarded by the Jadavpur University.  
*Supervisor* : Dr. P. K. Tapaswi

**Psychometry Unit**

3. Sm. Anjali Ghosh : "Development of a scale for measuring Managerial skill", degree awarded by the University of Calcutta.  
*Supervisor* : Professor S. Chatterjee

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### Population Studies Unit

4. Shri Satyendra Lal De : "The Problems and Prospects of Economic Development of the Basanti P.S. Area in the Sundarbans", degree awarded by the University of Calcutta.  
*Supervisor* : Dr. Asis Kumar Roy

The following is the list of Ph.D. degree obtained by the persons not engaged in Indian Statistical Institute who had worked under the guidance of the faculty of the Institute.

1. Sm. Neelanjana Mitra : "An Econometric study of some aspects of the Indian Tea Industry", degree awarded by the University of Calcutta.  
*Supervisor* : Dr. Dipankar Kundu (ISI., Cal)  
Professor M. K. Rakshit  
(Presidency College, Calcutta)
2. Shri Kewal Ram : "Petrochemical Industry in India. Its Production Linkages and Technology Indigenization Process", degree awarded by the Gujarat University.  
*Supervisor* : Dr. Atul Sarma

### (2) Theses Submitted for Ph.D. Degrees :

The following is the list of Ph.D. theses submitted by the Research Fellows, Research Assistants and Project Assistants of the Institute.

1. Sm. Soma Mukherjee : "Some thermal and electrical studies of human skin", University of Calcutta.  
*Supervisor* : Professor A. B. Gupta
2. Sm. Padmaja Pal : "Studies on Level of Living and Poverty in Rural India", Indian Statistical Institute.  
*Supervisor* : Professor N. Bhattacharya

The following is the list of Ph.D. theses submitted by the members of the staff of the Institute.

### Leaf Protein Unit

1. Sm. A. Banerjee : "Utilization of aquatic weeds with stress on their nutritive value", University of Calcutta.  
*Supervisor* : Professor S. Maiti

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SQC & OR Unit

2. Shri S. R. Mukherjee : "On some problems of Optimum Divisions in Geological Exploration and Mining Investment", University of Calcutta.  
*Supervisor* : Professor A. K. Saha
- 3: Shri Aravind Seth : "Component Importance in a consecutive—K-out-of-n : F Systems", Indian Statistical Institute.  
*Supervisor* : Professor K. G. Ramamurthy

The following is the list of Ph.D. theses submitted by the persons not engaged in Indian Statistical Institute but worked under the guidance of the faculty of the Institute.

1. Shri Paragmay Chatterjee : Evolutionary Stages of the Universe, Space-Time Torsion and Supergravity", University of Calcutta.  
(U.G.C., Teacher Fellow)  
*Supervisor* : Professor P. Bandyopadhyay

**Part II. Convocation, Visiting Scientists, Honours and Awards,  
Scientific Tours and Assignments**

**7. TWENTY-FOURTH CONVOCATION**

The Indian Statistical Institute held its Twenty-fourth Convocation for awarding the Ph.D., M.Tech., M.Stat. and B.Stat. (Hons.) degrees, Post-graduate diplomas in Applied Statistics and Diplomas in Statistics on 29 December, 1989. Shri P. N. Haksar, Chairman of the Council of the Institute, presided over the Convocation function. Professor J. K. Ghosh, Director of the Institute, welcomed the guests and presented the annual review of research, teaching and training activities of the Institute. Dr. C. R. Rao, F.R.S., National Professor, India and Eberly Professor of Statistics, Pennsylvania State University, U.S.A., delivered the Convocation Address entitled, "Taming of Uncertainty".

Special mention may be made that Professor C. R. Rao was awarded the degree of Doctor of Science (D.Sc.) *Honoris causa* at this convocation for his pioneering and outstanding contributions to statistical theory and methods. The Indian Statistical Institute honoured Professor Rao as a scholar of great depth, as creator of new frontier areas in statistics, as a great teacher who has inspired two generations of students, as a promoter of statistical thinking and applications in all areas of human endeavour for the benefit of the society, as an intellectual interested in broader philosophical issues connected with science, scientific method and decision making under uncertainty, and above all, as a distinguished alumnus of the Institute.

The number of candidates awarded degrees and diplomas is given below :

Degrees/Diplomas	Number of candidates
Doctor of Philosophy (Ph.D.)	6
Master of Technology in Computer Science (M.Tech.)	18
Master of Statistics (M.Stat.)	52
Bachelor of Statistics (Honours) ((B.Stat.(Hons.))	11
Post-graduate Diplomas in Applied Statistics :	
(i) Statistical Quality Control and Operations Research, Calcutta	9
(ii) Statistical Quality Control and Operations Research, Delhi	5
(iii) Statistical Quality Control and Operations Research, Bangalore	1
(iv) Statistical Quality Control and Operations Research, Bombay	2
(v) Statistical Quality Control and Operations Research, Madras	1
Diploma in Operation and Programming of Automatic Data Processing Equipment	9
Associateship in Documentation and Information Science, Bangalore	6
Professional Examinations in Statistics :	
(i) Senior Diploma in Statistics	1
(ii) Junior Diploma in Statistics	1
<b>Total :</b>	<b>122</b>

8. VISITING SCIENTISTS

A number of distinguished scientists from abroad and India participated in the research, training and other scientific activities to the Institute during the year. Some of them came to the Institute on invitation and spent fairly long period at the Institute to assist in the regular research and teaching programme while others came for short periods and gave lectures and seminars. Most of them were available for consultations by the faculty members of the Institute.

1. Dr. N. R. Chaganty, Old Dominion University (March—June 1989).
2. Dr. S. Ramaswamy, has been a visiting scientist in the ISI Bangalore Centre since prior to April 1989, he gave some seminar talks on the Radon-Nikodym theorem for Banach spaces; he also delivered several lectures on 'B-convex spaces' at the winter school held in December 1989.
3. Dr. Moni Nag, Senior Associate, Population Council, U.S.A. (26.4.89 & 15.11.89).
4. Dr. B. N. Mondal, Calcutta University, Calcutta (4.5.89). Lecture : 'Scattering by nearly-vertical barrier a perturbational approach'.
5. Dr. Mythili Ramaswamy, Tata Institute of Fundamental Research, Bangalore (9.5.89). Lecture : 'On Saint Venant's problem'.
6. Dr. C. S. Karuppan Chetty, Regional Engineering College, Tiruchy (10.5.89). Demonstration : Memory of Numbers.
7. Dr. R. Narashimhan, University of Bombay, Bombay (12.5.89). Lecture : 'The Jacobian problem'.
8. Dr. Richard Palmner-Jones, University of East Anglia, Norwich, UK (12.5.89).
9. Professor S. S. Sane, Department of Mathematics, University of Bombay (17.5.89-19.5.89). Lecture : "Quasi-symmetric designs".
10. Professor K. Varadarajan, Calgary University, Canada (28.5.89 — 3.6.89). Lectures : (i) 'Aperiodic rings I'; (ii) 'Aperiodic rings II' and (iii) 'Acyclicity of certain homomorphism groups'.
11. Dr. R. S. Chikkara, University of Houston, USA (31.5.89). Lecture : 'Role of remote sensing in crop survey'.
12. Dr. P. Jeganathan, University of Michigan, Ann Arbor (May—September 1989). Visited the ISI Bangalore Centre.
13. Professor R. Khattree, North Dakota State University, USA (5.6.89—10.7.89). Lecture : 'On a class of orthogonal invariant and residual independent matrix distributions'.
14. Professor Andre Beteille, University of Delhi, Delhi (23.6.89). Lecture : 'Caste and politics in contemporary India'.
15. Dr. D. Venugopala Rao (7.6.89 — 22.6.89). Lecture : 'PM matrices'.
16. Professor R. Tandon, University of Hyderabad, Hyderabad (26.6.89) visited ISI Bangalore Centre. Lecture : 'Non-abelian class field theory'.

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17. Dr. Y. Neuvo, Tampere University of Technology, Finland (5.7.89). Lecture : 'Combinatorics of least squares and least absolute deviation operations'.
18. Smt. Dipali Nag, Sangeet Research Academy, Calcutta (11.7.89). Lecture : 'Features related to characterisation of Ragas in Hindusthani Music'.
19. Dr. B. R. Chatterjee, Leprosy Field Research Unit, Jhalda (23.7.89). 'Ectare : 'Immunogenetic epidemiology of malaria'.
20. Dr. Radheshyam Bairagi, Senior Scientist, ICDDR, B. (21.7.89).
21. Dr. Sajal K. Das, Department of Computer Science, University of North Texas, USA (July 1989). Lecture : 'Stirling Networks--A versatile Tree--interconnection interconnection topology'.
22. Mr. Suresh K. Vaidyanathan, Carnegie Mellon University, USA (1:8.89). He had discussions with faculty and students of the Economic Analysis Unit, Bangalore.
23. Dr. S. Huda, King Saud University, Riyadh, Saudi Arabia (9.8.89--17.8.89).
24. Dr. G. V. Ramji, University of Hyderabad, Hyderabad (9.8.89). Lecture : A conjecture of Diestel'.
25. Dr. Nigel Crook, School of Oriental and African Studies, University of London, UK (11.8.89).
26. Professor Subir Bandyopadhyay, University of Windsor, Canada (14.8.89). Lecture : 'Logic programming for knowledge-based system'.
27. Professor D. Raghavarao, Temple University, USA (14.8.89). Lecture : 'Group testing designs'.
28. Professor H. I. Anderson, University of Troidheim, USA (17.8.89--18.8.89). Lectures : (i) 'Rotating turbulent flow' and (ii) 'Non-Newtonian fluid'.
29. Professor Raj Dhruvarajan, University of Manitoba, Canada (21.8.89). He had discussions with faculty and students of the Economic Analysis Unit, Bangalore.
30. Dr. V. Pati, was a visiting scientist in the ISI Bangalore Centre during the period August 1988--August 1989.
31. Dr. David Mustered, University of New South Wales, Australia (August--October 1989), visited the ISI Bangalore Centre. Lecture : 'Uncertainty principles invariant under the group of fractional fourier transforms'.
32. Dr. (Ms.) Rosalind Miller, Professor, Library Media Education, Georgia State University, Atlanta, Georgia, USA (5.9.89). Lecture : 'Library Automation'.
33. Professor L. Streit, University of Beilefeld, West Germany (14.9.89--15.9.89). Lectures : (i) 'White noise analysis' and (ii) 'White noise analysis and dirichlet forms'.
34. Professor S. Parthasarathy, Director, Institute of Information Studies, Madras (20.9.89). Lecture : 'Library Automation'.

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35. Dr. A. Vaidyanathan, Madras Institute of Development Studies, Madras (21.9.89). Seminar given : 'Current Research in Irrigation and Agriculture'.
36. Professor S. G. Dani, Tata Institute of Fundamental Research, Bombay (September 1989). Lecture : 'Values of quadratic forms at integral points'.
37. Dr. N. Nitsure, Tata Institute of Fundamental Research, Bombay (4.10.89). Lecture : 'The Riemann monodromy problem'.
38. Professor David Vera Jones, Victoria University of Wellington, New Zealand (9.10.89—12.10.89). Lectures : (i) 'Percolation processes : A model for rock fracture' and (ii) 'Stochastic and statistical properties of stress release models for earthquakes'.
39. Professor Dilip Roy, Department of Business Administration, Burdwan University (23.10.89). Lecture : 'Some characterizations based on residual life'.
40. Professor V. Ptak, Institute of Mathematics, Czechoslovak Academy of Science, Prague (26.10.89—2.11.89). Lecture : 'Banach algebras with involution'.
41. Dr. S. K. Bhat, University of Manitoba, Canada (7.11.89—5.12.89). Lecture : 'Linearization technique for concave programming'.
42. Dr. Murvin N. Muller, Ohio State University, USA (9.11.89). Lecture : 'Direction in statistical computing'.
43. Professor S. K. Basu, Indian Institute of Management, Calcutta (20.11.89). Lecture : 'Some statistical aspects of inventory management'.
44. Dr. Krishna Maddaly, Institute of Mathematical Sciences, Madras (20.11.89 — Feb. 90). Lecture : (i) 'Anderson model and absolutely continuous spectrum' and (ii) 'Spectra of Schrodinger operators'.
45. Dr. M. K. Ghosh, Tata Institute of Fundamental Research, Bangalore (23.11.89). Lecture : 'Controlled diffusions with limiting average costs'.
46. Professor S. G. Mohanty, McMaster University, USA (23.11.89). Lecture : 'On some distributions related to lattice path combinatorics'.
47. Professor Charles Lindblom, Emeritus Professor, Yale University, USA (27.11.89). Lecture : 'Present state of American democracy'.
48. Dr. N. Somasundaram, has been a visiting scientist in the ISI Bangalore Centre since November 1989. He gave a talk on 'Harmonic analysis for operators'.
49. Dr. K. B. Athreya, Iowa State University (3.12.89—8.1.90) (i) Bootstrapping the Markov chain with countable state space' and (ii) 'Continuous time stochastic control problems'.
50. Dr. T. S. Kemp, Vertebrate Palaeontologist, University of Oxford under the auspices of INSA—Royal Society (U.K.) exchange programme (22.12.89—9.1.90). Lecture : 'Cladistic analysis and its application to vertebrate palaeontology'.
51. Dr. D. Kanna, University of Georgia (28.12.89) visited the ISI Bangalore Centre. Lecture : 'Multiplicative integral via finitely multiplicative measures'.



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52. Dr. Anirban Dasgupta, Purdue University, West Lafayette, Purdue, USA (20.12.89). Lecture : 'Diameter and volume minimizing confidence sets in Bayes and classical problems'.
53. Professor I. Pronin, Moscow State University (December 1989). Lecture : 'Quantization of Gravity'.
54. Professor Kamal C. Chanda, Texas Tech. University, USA (1 & 4.1.90). Lectures : (i) 'Existence and asymptotics of  $m_n$ -decomposable processes P' and (ii) 'Existence and asymptotics of  $m_n$ -decomposable processes II'.
55. Professor P. K. Sen, University of North Carolina, Chapel Hill, USA (3.1.90). Lecture : 'GNP—optimality and admissibility of multivariate estimators'.
56. Dr. I. K. Rana, Indian Institute of Technology, Bombay (4.1.90). Lecture : 'The reconstruction of a function from its moving averages'.
57. Professor Bimal K. Sinha, UMBC—Catonsville, Maryland, USA (8.1.90). Lecture : 'Estimation of common location parameter'.
58. Dr. Shashikala Sukhatme, Iowa State University (8.1.90) visited the ISI Bangalore Centre. Lecture : 'The best precedence test in life testing experiments'.
59. Dr. Subhas Roy, Department of Economics, University of Connecticut USA (8.1.90—31.3.90) Dr. Roy addressed a seminar and gave a course of lectures on 'Time Series Analysis' during his stay in the Economic Research Unit, Bangalore.
60. Dr S. Ramakrishnan, University of Miami, USA (9.1.90). : Lectures : (i) 'Domination of Borel stopping timer' and (ii) 'Pocket transmission in a ring network'.
61. Professor M. N. Das, Ex-Director, IASRI, New Delhi (18.1.90). Lecture : 'On eigen-values of C-matrix of block designs'.
62. Dr. Rabindranath Sen, Department of Applied Maths, Calcutta University, Calcutta (29.1.90). Lecture : 'On an iterative method involving semi-inner product in a Banach space'.
63. Dr. Carlo Cecchini, University of Genoa (January—February 1990) visited the ISI Bangalore Centre. Lecture : 'Modular theory and non-commutative probability'.
64. Professor David Alasdair Kemp, Computing Standards Officer (Information Scientist), Institution of Electrical Engineers, London, UK (26.2.90—27.2.90). Lecture : 'Knowledge-based Information Management'.
65. Professor V. De Sabbata, University of Bologna and Director, International School of Cosmology of Gravitation (February 1990). Lecture : 'Implication of Torsion'.
66. Professor Chandler Davis, University of Toronto, visited Delhi Centre of the Institute from 2 March to 20 April 1990. His travel was financed by NSERC of Canada and local hospitality by the Institute. He continued his collaboration on matrix and operator inequalities with R. Bhatia. One research paper 'More matrix forms of the arithmetic-geometric mean inequality' was prepared and submitted for publication. Another paper is under preparation. He gave a talk

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'Clifford Analysis and Spectral Perturbation'. He also visited the Centre for Advanced Study in Mathematics, Panjab University, Chandigarh and the Bangalore Centre of the Institute briefly. Some research workers from Delhi University also consulted him.

67. Dr. Nilotpal Chakravarti, IIM, Calcutta (5.3.90). Lecture : 'Isotonic median regression for orders representable by rooted trees'.
68. Dr. W. Von Waldenfels, University of Heidelberg (March 1990). Lectures : 'Quantum stochastic processes on  $*\text{-bialgebras}$ '.
69. Dr. Hemant Bhat, Institute of Mathematical Sciences, Madras (March—April 1990) visited the ISI Bangalore Centre. Lectures : 'Inverse spectral problems'.
70. Dr. Sanpei Kageyama, Hiroshima City University, Hiroshima, Japan. He had discussions with members of the Stat. Math. Division.
71. Dr. Piotr Stanisewski, Academy of Sciences, Warsaw, Poland. He had discussion with members of the Stat. Math. Division and did some joint research work.
72. Dr. M. A. Tsai, Department of Mathematics, Academia Sinica, Taiwan, Republic of China, visited the Stat. Math. Division and had discussion with members of the Division and did some joint research work.
73. Professor Amitahha Bose, Indian Institute of Management, Calcutta, continued as a Visiting Professor of the Institute. Dr. Bose lectured for the M. Stat. (QEP) course and participated regularly in the academic programmes of the Economic Research Unit.
74. Professor Ashok Rudra, Visva-Bharati, Santiniketan, continued as a Visiting Professor of the Institute and participated regularly in the project works taken up jointly by him and some faculty member of the Economic Research Unit.
75. Dr. Anup Kumar, Centre for Studies in Economics, Presidency College, Calcutta continued as a guest lecturer of the Institute and lectured for the M. Stat. (QEP) Course.
76. Dr. Mogaddam from Iran visited SQC & OR, Bangalore and undergone training in Taguchi Methods and its Application. He carried out three projects at Vallajpa Textile Mills.

#### 9. HONOURS, AWARDS AND SPECIAL ASSIGNMENTS

Professor J. K. Ghosh (Stat-Math.) is : (i) Member, Governing Body of Jagadish Bose National Science Talent Search, (ii) Member, Science and Technology Department, Government of West Bengal, (iii) Member, Port Management, West Bengal, (iv) Member, National Advisory Board on Statistics, Government of India (v) Member, Sectional Committee I, of Indian National Science Academy, (vi) Member, Indian Academy of Sciences, Bangalore, (vii) Expert Member on the Sub-Committee on Mathematics set up by UGC in 1989, (viii) Member of the National Committee on Mathematics Education and Research, Ministry of Technology, Government of India. Professor Ghosh delivered keynote address at the National Seminar on Recent Advances in Statistical

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Inference at the Department of Statistics, University of Rajasthan, Jaipur, 24 February 1990.

Professor A. K. Roy (Stat-Math.) served as a Member of the Mathematics Advisory Committee for BRNS, Bombay. Professor Roy also served as a member of NBHM, Bombay.

Professor S. Das Gupta (Stat-Math.) served as a member of the Advisory Committee for Development of Personnel in Science and Technology, Ministry of Human Resources, Govt. of India.

Professor Das Gupta was a judge in the J. C. Bose National Science Talent Search Committee.

Professor S. B. Rao (Stat-Math.) was a Member of the UGC Panel of Mathematics, New Delhi.

Dr. R. Bhatia (Stat-Math.) was appointed as (i) National lecturer by the University Grants Commission, New Delhi; (ii) Member, Editorial Board, Linear Algebra and its applications; (iii) Member, Linear and Multilinear Algebra, both International Journals.

Dr. S. K. Mitra (Stat-Math.) was elected Fellow of the Indian Academy of Sciences.

Dr. B. L. S. Prakasa Rao (Stat-Math.) was appointed as (i) Co-Editor, Sankhy<sup>2</sup>, Ser. A; (ii) Member of Editorial Board, Statistics and Probability Letters; (iii) Member of Mathematics and Statistics Research Committee of CSIR, Govt. of India for a period of 3 years with effect from 1.4.89; (iv) Member of Sectional Committee I of Indian National Science Academy for a period 3 years with effect from 1.1.90; (v) Member of course writers committee for courses being developed by Indira Gandhi National Open University and (vi) Participated as a member of the editorial board for the Proceedings of R. C. Bose Symposium held at Delhi, December 1988.

Dr. K. B. Sinha (Stat-Math.) was awarded the prestigious (i) S. S. Bhatnagar prize for 1988 in Mathematical Sciences, by CSIR, New Delhi; (ii) C. V. Raman Centenary award from Jagdish Bose Science Talent Search, Calcutta and appointed (iii) Member, Sectional Committee, Indian Academy of Sciences, Bangalore; (iv) Member, Special Committee for Physical Sciences, Jawaharlal Nehru University, New Delhi; (v) Member, Standing Committee of the COSIST Programme of UGC in Sambalpur University, Department of Mathematics.

Professor D. Dutta Majumder (Electronics and Communication Sciences) has been elected Fellow of the National Academy of Sciences, India, at Allahabad from 1990.

Professor Dutta Majumder continued to serve as Members: (a) Board of Directors—VIII Int. Congress on World Organisation of Systems and Cybernetics, Hunter College City University of New York, USA, 11-14 June 1990. (b) Governing Board of IAPR and also member of Technical Committee on 'Statistical Pattern

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Recognition' of IAPR (Continuation). (c) Sectional Committee of INSA, New Delhi. (d) Apex Committee of KBCS Programme of Electronics Commission, New Delhi (Continuation). (e) Technical Advisory Board of CSIR, New Delhi. (f) Research Committee of JNU, New Delhi. (g) Research council of CFRI, Dhanbad, Dhanbad. (h) Research Council of Centre for Mathematical Modelling (under CSI) NAL, Bangalore. (i) Scientific Advisory Committee of BIM, Calcutta.

Professor A. B. Gupta (Physics) has been made (i) Member, Journal Committee, Indian Journal of Dermatology, (ii) Member, Innovation Committee, Indian Association of Dermatologists, Venereologists and Leprologists and (iii) Member, Board of Examiners of the Universities of Madras and Jadavpur.

Dr. D. Saha (Geological Studies) has been appointed by the Geological, Mining and Metallurgical Society of India as one of the editors of their publication, Indian Journal of Geology, for the sessions 1989-1991.

Professor K. C. Malhotra (Anthropometry and Human Genetics) served as member of the Expert Committee on Application of Science and Technology for the Development of weaker sections of the society of DST ; served as Chairman of the monitoring committee to evaluate core support to SRI, Ranchi and CTD, New Delhi, constituted by DST ; member task force on Application of Science and Technology for Tribal development, DST appointed expert by DST to evaluate its project in U.P. ; appointed UGC National Lecturer for 1990-91 ; member task force on Micro level planning of natural resource use, Dept. of Environment and Forests, 1989-1990 ; appointed member of the editorial board of Journal of Orissa Environmental Society ; appointed member of task force on natural resources instituted by ICSSR, New Delhi ; invited as a visiting UGC Professor for 6 months, Manipur University, Imphal ; invited as Resource person, workshop on Anthropology and Health, 12-19 August 1990, Zagreb ; invited speaker from abroad to participate in Conference of International Association of Human Biologists and Japan Society of Human Genetics, Fukui 30 July-3rd August, 1990 ; was chief Guest at the workshop on Pre-natal diagnosis of haemoglobinopathies, Pune, February 12-11, B. J. Medical College, Pune ; appointed member of IUAES Commission on Medical Anthropology and Epidemiology.

Dr. B. M. Reddy (Anthropometry and Human Genetics) (i) Appointed as Joint Editor for the proceedings volume of the International Dermatoglyphics Conference on 'Progress and Trends in Dermatoglyphics Research', organized by IBRAD 27-29 January, 1990, Calcutta ; (ii) Appointed as the South Asian Regional Correspondent for the Bulletin of the International Dermatoglyphics Association.

Dr. Chandralekha Duttgupta (Biochemistry) continued as Visiting Assistant Professor, Einstein College of Medicine, Bronx, NY., U.S.A. Dr. Duttgupta has been appointed as Honorary Teacher, Biochemistry Department, University of Calcutta.

Dr. Robin Mukherjee (Economic Research) continued as ISI representative on the Governing Council of the National Sample Survey Organization, Government of India.

Dr. Manabendu Chattopadhyay (Economic Research) has been appointed a member and consultant to the Study Group on Social Constraints of Rural Labour set up by the National Commission on Labour, Ministry of Labour, Government of India.

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Dr. D. Coondoo (Economic Research) has been appointed Co-Editor *Sankhya*, Series B.

Dr. Dilip Mookherjee (Planning) : Co-editor, *Economic Theory & Policy Essays* in Honour of Dipak Banerjee, Oxford University Press, New Delhi, 1990.

Dr. L. S. Bhat (Planning) : (i) Member of the Steering Committee on Natural Resource Data Management Systems constituted by the Department of Science and Technology (DST); (ii) Member of Advisory Committee on Land and Water Management constituted by the DST; (iii) Member, Advisory Committee on educational planning at the District level, NIEPA, Delhi; (iv) Secretary-General, National Association of Geographers, India (NAGI); (v) Member, Research Programme Evaluation Committee on Resources and Regional Development, National Institute of Science, Technology and Development Studies (NISTADSO of CSIR), New Delhi.

Dr. Atul Sarma (Planning) chaired the Session of International Theory organised by the 27th Indian Econometric conference held in Aligarh during January 4-6, 1990.

Dr. Partha N. Mukherji (Planning) (i) Chaired a session in the Workshop on Peoples Movement and Grass Root Initiative, organised by Deptt. of Political Science, Delhi University on 24th February 1990; (ii) National Seminar on Emergence of Organised Peasant Power Deptt. of Political Science, Punjab University, Chandigarh. 3rd-4th March, 1990. Chaired a session on : Emergence and Role of Peasant Power in India; Theoretical Perspective; (iii) Elected member of Executive Committee of the Indian Association of Social Sciences Institutes, April 1989-March 1991; (iv) Block Editor of the Unit on 'Social Change' Indira Gandhi National Open University, New Delhi; (v) Consultant for Project Evaluations, Indian Council of Social Science Peasant; (vi) Chairman of the Study Group Social constraints on Rural Labour sponsored by National Commission on Rural Lab., Ministry of Labour, Government of India, 1990.

Dr. Atul Sarma (Planning) : (i) Edited the book entitled *Finance Commission and State Forecasts : An Evaluation* to be published by NIPFI, New Delhi in memory of Dr. V. G. Rao; (ii) Member of National Committee on Development of Assam constituted by Government of India, Planning Commission; (iii) Member, Panel on Tribal Studies constituted by the Indian Council of Social Science Research, New Delhi.

Professor S. Chatterji and Professor M. Mukherjee (Psychometry) served as members of the Expert Committee in the area of Educational Testing and Psychological Measurement for selections for U.S. Post-doctoral fellowships (Fullbright Research Scholar grants) in August, 1989.

Dr. S. Bandyopadhyay (Sociology) has been elected (i) Member, Advisory Committee, Eastern Regional Centre of the ICSSR, Calcutta; (ii) Expert Member of Ph.D. Committee in Anthropology, Calcutta University; (iii) External Expert Member, Board of Post-Graduate Studies in Sociology, University of Burdwan, Burdwan; (iv) Member, Post-Graduate Board of Studies in Sociology, University of Kalyani, Kalyani; (v) Member, Committee of Experts, Netaji Institute of Asian

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Studies, Calcutta (nominated by Chief Minister, Government of West Bengal) ;  
(vi) Member, Expert Committee in the area of Anthropology/Sociology for  
selection of post-doctoral junior and senior Fulbright fellowships, USEFI.

Shri B. K. Pal (SQC & OR) served as the Hony. Secretary of National Institution  
for Quality and Reliability, National Body till March, 1990 ; Member, Organising  
Committee of Asian Congress on Quality and Reliability, Organising Secretary of  
2nd Asian Congress on Quality and Reliability at Bangalore (6,-7 November, 1989).

Shri C. A. Setty (SQC and OR) was Hony. Treasurer, NIQR, Bangalore Branch ;  
Hony. Treasurer of ACQR Post Congress Conference at Bangalore.

Shri R. Anantha Rao (SQC and OR) was Hony. Secretary, NIQR Bangalore  
Branch (1989-90) ; Member, Executive Council, NIQR (National Body) ; Member,  
NIQR, Bangalore Branch Council ; Member, NIQR Quality and Reliability Journal  
Editorial Board.

Shri K. N. Anand (SQC and OR) served as Hony. Joint Secretary, ACQR, Post  
Congress Conference at Bangalore ; Convener, NIQR Bangalore Branch training and  
education committee ; Member, NIQR Bangalore Branch Council.

Dr. R. J. Pandey (SQC and OR) prepared 16 abstracts of Research Papers from  
European Journal of OR, Canadian Journal of Statistics, IEE Transactions on  
Information Theory, Simulation, etc. for Executive Sciences Institute, USA.

Dr. Pandey served as (i) Joint Secretary, Post Congress Conference of ACQR  
'89 at Calcutta, (ii) Member of referencing committee of ACQR '89 technical papers,  
screening committee and facility committee, (iii) Member of Special Committee for  
examining tender/quotation for publishing the proceedings of ACQR '89, (iv) Member,  
Board of Studies of IAPQR, (v) Expert NDRI, Kalyani recruitment committee,  
(vi) Member, Board of Examination, Calcutta University.

Shri D. T. Ghosh (SQC and OR) served (i) as a member in a committee for  
evaluation of the education policy of the Govt. of West Bengal—a study undertaken by  
Socio-Economic Research Institute, (ii) Jointly with Dr. B. Das of Presidency College  
prepared a draft Indian Standard on Statistical Tolerance Interval at the request of  
Bureau of Indian Standards.

Shri A. N. Nankana (SQC and OR) (i) participated in 5 committee and sub-  
committees of Bureau of Indian Standards, (ii) Member of Review Committee DCQA,  
Ministry of Defence, (iii) Member of Programme Advisory Group by Quality Circle  
on protection through Science and Technology of DST, (iv) Shared the responsibilities  
of Secretary Finance Committee, Joint Secretary Exhibition Committee, Chief Organiser  
for QA in service sector session, Chief Organiser of Technical visits to Industries at  
ACQR '89, (v) participated in Press Conference on 25 October on ACQR '89 and  
contributed a write up 'Myths about Quality'.

Shri P. R. Lakshmikanth (SQC and OR) served as a Convener of the expert  
committee by BIS on the method of sampling for doors and windows.

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Shri Rajib Goel (SQC and OR) shared the responsibilities of secretary, facility committee, secretary, transport sub-committee and two other sub-committees as secretary, at ACQR '89.

Shri V. Narayana (SQC and OR) presided over the inaugural function of Quality Month Celebration in Hindustan Cables Ltd., on 4 April 1989.

Shri J. Venkatappaiah (SQC and OR) abstracted 27 papers for Executive Sciences Institute, USA.

Shri V. Narayana Iyer (SQC and OR) (i) continued as a Director of M/s. Karur Mills Ltd., Karur, (ii) member of Expert Advisory Committee of Electronics Testing and Development Council (ETDC), Trivandrum Centre, (iii) Member of Quality Leadership Award Committee of NIQR, Trivandrum Branch.

Professor G. Bhattacharya (DRTC) has been awarded 'IATLIS-MOTIWALE Best Teacher Award' for the year 1989 at a special function organised by IATLIS during its VIIIth National Seminar held at Rajkot during 14-16 December 1989. The award was offered for the first time in 1989. The award carries a 'Citation' and a 'Memento'.

#### 40. SCIENTIFIC TOURS AND ASSIGNMENTS ABROAD

Professor J. K. Ghosh (Stat-Math.) visited USSR in June 1989 under the Indo-Soviet Cultural Exchange Programme approved by the Government of India. He also visited the Purdue University, USA as a Visiting Professor from August 1989 to middle of December 1989.

Professor S. Das Gupta (Stat-Math.) visited USSR in June 1989 under the Indo-Soviet Cultural Exchange Programme approved by the Govt. of India and gave seminars at Steklov Institute, Leningrad, and Institute of Statistics and Economics at Moscow.

Professor Das Gupta was also invited by the University of Connecticut, Storrs, U.S.A., New York University, New York, U.S.A., and Boston University, U.S.A., in September 1989 and gave seminars at each of these Universities.

Dr. B. Bagchi (Stat-Math.) visited the Department of Mathematics, Technical University of Eindhoven, The Netherlands at the invitation of the said Department, during 14 September to 15 December 1989. Dr. Bagchi collaborated with Professors A.E. Bruwer and H. A. Wilbrink resulting the paper "Notes on binary codes related to the  $O(5, q)$  generalised quadrangles".

Dr. S. C. Bagchi (Stat-Math.) visited the University of Puget Sound, Tacoma, USA as a visiting Associate Professor of Mathematics from August 1989 to June 1990. He gave talks on his research at the colloquium of (i) the Department of Mathematics, University of Washington, Seattle, USA on 26.2.90 and (ii) the Department of Mathematics, University of California, Berkeley, USA on 6.5.90.

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Dr. T. K. Chandra (State-Math.) visited Switzerland to attend the international conference on "Statistical Data Analysis and Inference" held in honour of Professor C. R. Rao during the period 21-24 August 1989 as an invited speaker and presented a paper. He also chaired a session.

Dr. Rahul Mukherjee (Stat-Math.) visited Switzerland to attend the international conference on "Statistical Data Analysis" held in honour of Professor C. R. Rao during the period 21-24 August 1989 as an invited speaker and presented a paper. He also chaired a session.

Dr. N. S. Narasimha Sastry (Stat-Math.) visited the Department of Mathematics, Rutgers University, New Brunswick, New Jersey, USA from 8 September '88 to June '89. Dr. Sastry also visited the Ohio State University, Columbus, USA.

Dr. G. M. Saha (Stat-Math.) visited the Department of Mathematics & Statistics, Western Michigan University, Kalamazoo during August 30, 1988 to August 18, 1989.

Dr. B. K. Sinha (Stat-Math.) visited the Department of Mathematics, Statistics and Computer Science, University of Illinois at Chicago during April-June 1989 as a Visiting Professor. He also visited Department of Statistics and Actuarial Sciences, University of Waterloo, Waterloo, Canada during July 1989 and taught courses and was engaged in collaborative research with Professor A. S. Hedayat and Professor K. R. Shah.

Dr. T. J. Rao (Stat-Math.) is visiting the Department of Statistics, University of California at Santa Barbara, USA from September 1989 to date.

Dr. R. Bhatia (Stat-Math.) visited the University of Toronto and the University of Guelph in Canada funded by the NSERC of Canada between 24 July-15 September, 1989 and did collaborative work with Professor C. Davis and Professor J. A. R. Holbrook.

Dr. Bhatia also gave an invited talk at the inaugural conference of the International Linear Algebra Society held at Brigham Young University, PROVO, USA, in August 1989.

Dr. R. L. Karandikar (Stat-Math.) visited Erasmus University, Rotterdam, The Netherlands as a Visiting Professor from 16 May to 15 July 1989. During this period he gave Colloquium talks/Seminar talks at— (i) University of Amsterdam, The Netherlands; (ii) University of Paris VI, France; (iii) University of Nancy, France; (iv) Strasbourg University, France. Dr. Karandikar also gave a series of lectures entitled "Short course on stochastic calculus" at University of Delft, Netherlands. Lecture notes were written and published as a Technical Report at Erasmus University.

Dr. K. R. Parthasarathy (Stat-Math.) visited (i) The University of Heidelberg, W. Germany from 27.11.89 to 3.12.89 and 9.12.89 to 17.12.89; and (ii) the University of Strasbourg, France, from 18.12.89 to 24.12.89.



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Dr. Parthasarathy also visited the following Institutes under Indo-USSR cultural exchange programme (a) Steklov Institute, Moscow, (b) Mathematics Institute, Lithuanian Academy of Sciences, Vilnius and delivered lectures—(i) a course of lectures on quantum probability in Moscow, and (ii) plenary address at the Vilnius Conference.

Dr. Parthasarathy also attended the Workshop on Quantum Probability and Applications, Trento, Italy, during 4.12.89 to 8.12.89 and delivered 3 lectures on A Survey of Quantum Stochastic Calculus.

Dr. B. Ramachandran (Stat-Math.) visited Department of Mathematics, University of Pittsburg, USA, from 22 August to 9 September 1989 and also visited the Department of Mathematics and Statistics of the McGill University, Montreal, Canada during his visit.

Dr. K. B. Sinha (Stat-Math.) visited—(i) University of Heidelberg for three weeks in December 1989, and (ii) University of Geneva, Geneva, Switzerland for one week in November 1989.

Dr. Sinha also participated in the Q.P. Workshop Conference, Trento, Italy, during December 1989 at University of Trento and Voltterra Institute, Rome, and delivered an invited talk on The Collapse Postulate in Quantum Mechanics.

Dr. S. K. Mitra (Stat-Math.) participated in the conferences—(i) Data Analysis and Inference, International Conference in honour of Professor C. R. Rao, Newebutel, Switzerland, during 21-24 August 1989. Plenary Session speaker, title—Block Independence in generalised inverse : a coordinate free look. (ii) Forty-seventh session of the International Statistical Institute, during 28 August—3 September 1989 and attended the Council meeting on 28 August 1989.

Dr. T. Parthasarathy (Stat-Math.) attended Edwin Smart Symposium at Department of Economics, Ohio State University, Columbus, USA, during 9-18 July 1989 and presented a talk titled Equilibria for discounted stochastic games.

Dr. B. L. S. Prakasa Rao (Stat-Math.) visited Stephen Banach International Mathematical Centre, Polish Academy Sciences, Poland under Indo-Polish Cultural exchange programme during 7-21 May 1989 and presented three invited lectures on Nonparametric Inference for Stochastic Processes.

Dr. Gadadhar Misra (Stat-Math.) spent about seven weeks in America in July/August 1989, dividing his time into visits to the State University of New York at Stony Brook, University of California at San Diego and University of Georgia, Athens.

Dr. Subhashis Nag (Stat-Math.) spent about six weeks in Europe in April/May 1989, when he visited the Institut des Hautes Etudes Scientifiques, Paris and gave colloquium lectures in the last week of April 1989 at the Universities of Bielefeld and Munster, and at the Fern Universität at Hagen; he later briefly visited the International Centre for Theoretical Physics at Trieste, in May 1989. He also gave an invited 1-hour lecture on Diff (Circle) and the Teichmüller spaces; a connection via String Theory at Lipman Bers' 75th Birthday Research Conference of the American Mathematical Society in California in July 1989.

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Dr. K. Rama Murthy (Stat-Math.) visited the University of Tennessee at Knoxville, Tennessee, from August 1988 to July 1989.

Dr. S. Ramasubramanian (Stat-Math.) visited Indiana University during August '88—May '89; he lectured, in April '89, at the Probability and Statistics Seminar on the Neumann problem : a probabilistic approach.

Dr. V. S. Sunder (Stat-Math.) visited Aarhus University for a month in September/October 1989 during which time, he also gave colloquium lectures in the Universities at Aarhus, Copenhagen and Odense. Dr. Sunder visited the University of Paris VII for a month, during October/November 1989, as part of an Indo-French Exchange Programme; at this time, he also gave a colloquium lecture at the University of Orleans on Commuting squares and subfactors.

Dr. Sunanda Bagchi (Applied Statistics, Surveys and Computing) visited the Department of Mathematics, University of Eindhoven, the Netherlands during, Sept. 6, 1989—Dec. 6, 1989.

Dr. Partha Pratim Majumder (Applied Statistics, Surveys and Computing) visited University of Pittsburgh, Dept. of Biostatistics, Sept. 1987—Sept. 1989.

Dr. Arijit Chaudhuri (Applied Statistics, Surveys and Computing) worked as a Visiting Professor since 15 August 1989 to March 1990 in Virginia Polytechnic Institute, U.S.A.

Dr. Shibdas Bandyopadhyay, (Applied Statistics, Surveys and Computing) participated in the Final Workshop on Differential Impact of the Modern Rice Technology Across Production environment. International Rice Research Institute, Manila, during 26-28 March 1990.

Professor P. Bandyopadhyay (Electronics) visited and delivered lectures at (1) Imperial College, London, U.K. (2) Max Planck Institute Fur Physik und Astrophysik, Munich, West Germany. (3) Institute of Theoretical Physics, Karlsruhe, West Germany (4) University of Catania, Italy (5) International Institute of Advanced Study, Trieste, Italy and (6) International Centre of Theoretical Physics, Trieste, Italy during the period 1st June—30th June 1989.

Professor Rajkumar Roychoudhury (Electronics) visited Physics Department, University of Ottawa, Canada from 1 June 1989 to July 1989 to do research in Theoretical Physics in collaboration with Professor Y. P. Varshni of University of Ottawa, Canada.

Dr. D. Saha (Geological Studies) visited the U.S.A. and the U.K. during the period from 4th July 1989 to 27th July 1989: (a) to attend, participate and present paper in the 28th International Geological Congress, Washington D. C., in the period from 9th to 19th July 1989 as a national delegate nominated by the Indian National Science Academy; (b) to visit the United States Geological Survey, National Centre, Reston, Virginia. Dr. Saha had scientific discussions with Dr. Rankin of the USGS on Rift Volcanism and Basin Evolution; (c) to attend and participate in a short course "Sedimentary Basin Analysis" organised under the auspices of 28th IGC in the

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period from 6th to 8th July, 1989, in the United States; (d) to visit, on invitation, the Cascades Scientific Ltd., Brunel University, England, on 21st and 27th July 1989 to have discussions regarding application of Secondary Ion Mass spectroscopy in geological sciences; and (e) to visit the Geology Department, Imperial College, London, on 24th July 1989 to have research discussions on relation between fold and cleavage development with Dr. J. W. Cosgrove.

Dr. K. C. Malhotra (Anthropometry and Human Genetics) visited University of Hamburg, Mainz, Köln and Bonn in West Germany and held discussions on ongoing research during 24 September to 29 September 1989. Dr. Malhotra visited Universities of Temple, Binghampton and Kansas in USA during October 1, 1989—2nd November 1989, and delivered invited lectures.

Dr. Malhotra also participated in the following Conferences abroad: (i) Medical Anthropology and Epidemiology: A cross-cultural Perspective, September 11-14, 1989, ZAGREB, Yugoslavia, presented an invited paper and chaired a session. (ii) 9th International Anthropological poster Conference, 14 September, Samobor, Yugoslavia, Chaired a session. (iii) International Congress on Dermatoglyphics, 14-17 September, Zegreb, presented a paper. (iv) Attended the first meeting of IUAES Commission on Medical Anthropology and Epidemiology, 16 September, Zegreb. (v) 21st Congress of the Gesellschaft für Anthropologie und Humangenetik, 19-23 September, 1989, Bremen, presented an invited paper. (vi) Indo-Pak Conference on Environment, 12-14 December, 1989, Lahore, Pakistan gave an invited talk.

Dr. B. Karmakar (Anthropometry and Human Genetics) attended 12th International Congress of Anthropological and Ethnological Sciences, Zagreb, Yugoslavia during 24-31 July 1988 and presented a paper.

Dr. A. K. Saha (Embryology) returned in May, 1990 from the H. C. Orsted Institutet, Denmark where he worked as a Guest Scientist for one academic year.

Professor N. Bhattacharya (Economic Research) rejoined Economic Research Unit in April 1989, after completing a UN teaching assignment at the Statistical Institute for Asia and the Pacific (SIAP), Tokyo. He also taught and directed a three-week Advanced Course on Projections for Social and Economic Planning, conducted jointly by ESCAP and SIAP (Tokyo) at Bangkok during 5-23 June 1989.

Professor Robin Mukherjee (Economic Research) served as a UNDP Consultant and taught a course on Economic Statistics and National Income at the 20th General Course in Statistics conducted by the Statistical Institute for Asia and the Pacific (SIAP), Tokyo, under UN ESCAP, from 1 October 1989 to 30 December 1989.

Professor Dipankor Coondoo (Economic Research) served as a UNDP consultant and lectured in the Country Course on Statistical Operations and Procedures organised by the Statistical Institute for Asia and the Pacific (SIAP), Tokyo, at Kuala Lumpur, Malaysia, from 12 February to 2 March 1990.

Dr. Abhirup Sarkar (Economic Research) attended the Concordia University, Montreal, Canada, as a visiting faculty during January—April 1990. Dr. Sarkar addressed seminars in the Concordia University, Montreal, Canada, in February 1990 and in the University of Rochester, New York, USA, in March 1990.

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Dr. S. R. Chakravarty (Economic Research) visited the University of Karlsruhe, FRG. He gave invited lectures at several universities in FRG, at the Hebrew University of Jerusalem, Israel, Centre for Economic Research, Tilburg University, the Netherlands, and University of Aarhus in Denmark. Dr. Chakravarty also presented papers at the 13th Symposium on Operations Research, University of Paderborn, FRG and at the 1st International Conference on Microeconomics, Liblice Castle, Prague, Czechoslovakia.

Dr. Anita Majumdar (Economic Research) visited the University of Pittsburgh, USA during February 1988-August 1989 and participated in a project entitled "systematic deviations between measures of real and nominal value-added shares of GDP" of the Department of Economics, University of Pittsburgh, USA.

Professor Partha N. Mukherji (Planning) visited the Department of Political Science, International Graduate School, Stockholm, Sweden and delivered a lecture on "Naxalbari Peasant Movement" in September 1989.

Professor Partha N. Mukherjee participated in International Workshop on Human Rights organised by Department of Sociology of Law, Lund University Sweden, August 25th-September 8th 1989 and gave lecture on Social Movements and Human Rights in India.

Professor Mukherjee also participated in a Seminar on Rural South East Asia in Transition, Department of Economics, University of Lund, Lund, Sweden, September 28-October 1, 1989.

Mrs. C. Juyal (Planning) presented a seminar on 'Survey on family planning : awareness, attitudes and practices among members of Parliament' at the Institute National de Demographic (INED), Paris, during September 1989.

Dr. Alokanda Mitter (Linguistics) visited Belgrade, Yugoslavia, at the invitation of the Institute for Experimental Phonetics and Speech Pathology Belgrade, Yugoslavia, from 14 August to 16 October 1989. During her stay she participated in the Belgrade Institute's project on "Speech Habilitation of the Pre-school age Hearing Impaired child with Kostic Methodology and Instrumentation". She also worked with Professor Kostic on the Unit's Plan projects and discussed expansion of research activities with him.

Dr. S. Bandyopadhyay (Sociology) as an invitee, participated in discussions with Overseas Development Group (University of East Anglia, Norwich, UK) and Overseas Development Administration, U.K. regarding regions of eastern India. He also participated in an evaluation workshop on "Social Development Project in Third World" organised by Centre for Development Studies, University College of Swansea, Wales, United Kingdom. He left India on 13 September 1989 and returned on 24 September 1989. Dr. Bandyopadhyay also prepared and presented a discussion note on "Problems of self-sustained agriculture : Observations on rain-fed farming in eastern India" in the workshop.

Dr. I. K. Ravichandra Rao (DRTC) attended the School of Library and Information Science of the University of Western Ontario, London, Canada during 3-5

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July 1989. 2nd International Conference on Bibliometrics. Dr. Ravichandra Rao was a member of the International organizing committee for the conference and was invited to present a paper at this conference. The title of Dr. Rao's papers was "Journal Productivity of Economics". Dr. Rao chaired a technical session of the conference. For the purpose of attending the conference Dr. Rao left India on 1st July 1989; and he returned to India on 10th July 1989. The Department of Science and Technology (DST), Government of India supported his travel to Canada by paying 50% of his travel expenditure.

Dr. I. K. Ravichandra Rao accepted an invitation for a visiting professorship in the Linburg Universitaire Centrum (LUC), Belgium. The period of his assignment was from 1st February 1990 to 30th April 1990. During his stay in Belgium Dr. Rao carried out research with Professor L. Egghe of the University. The areas of their research were (i) Citation age data and obsolescence function; and (ii) Classification of growth models. On completion of the research, they reported the results in two papers. During his stay in the University, Dr. Rao was invited to make a leading presentation in a seminar on "Library Education" with special reference to India. Dr. Rao left India on 30th January 1990; and he returned to India on 2nd May 1990.

Dr. F. J. Devadason (DRTC) at the invitation of the Asian Institute of Technology (AIT), Bangkok, Thailand acted as a resource person for the Seminar on "Information Users Study", organized by AIT. The seminar was held during 22-24 November 1988. Dr. Devadason presented an invited paper in that seminar entitled "Trends in Information user's study : Identification of Information needs". To attend the seminar Dr. Devadason left India on 20th November 1989; and he returned to India on 27th November 1989.

Shri K. K. Banerjee and Shri S. C. Chakraborty (SQC & OR) attended Top Management Programme on Quality Management at Stockholm during May-June 1989.

Shri B. K. Pal (SQC & OR) attended International Conference on Quality Control at Argentina and read a paper entitled "Taguchi methods in Indian Industries—an experience" in October 1989. Shri Pal also delivered an invited talk on the same subject at the International Conference on Quality Control at Rio-de Janeiro (Brazil) during October 1989.

Shri A. Rajagopal (SQC & OR) visited Singapore, Indonesia, Hongkong, Philippines, etc., for export promotion during November-December 1989. He also visited U.K. and Italy for market survey during February 1990.

Shri P. K. Perumallu (SQC & OR) is attending International Training Programme in Quality Control in Industries at Stockholm from March 1990.

### 11. SCIENTIFIC ASSIGNMENTS IN INDIA

Professor J. K. Ghosh (Stat-Math.) participated in the Asian Congress on Quality and Reliability held in Delhi from 30 October to 2 November 1989.

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Professor S. Das Gupta (Stat-Math.) presented an invited paper on 'Correlation and Dependence' at the Professor H. K. Nandi Memorial International Symposium held at the Dept. of Statistics, University of Calcutta in December, 1989.

Mr. Pradipta Bandyopadhyay (Stat-Math.) attended the Workshop on Vector Measures and Geometry of Tensor Product Space, I.S.I. Bangalore, 18 December 1989 to 4 January 1990. He presented paper by Dirk Werner on denting points in Tensor product spaces and also gave an expository talk on their work on the Mazur Intersection property.

Dr. A. K. Chattopadhyay (Stat-Math.) participated in the teaching programme of Summer School of Statistics 1989 at Bangalore, I.S.I.

Dr. Ratan Dasgupta (Stat-Math.) participated in one day  $G$ -Inverse Conference in Delhi, I.S.I. on 9.2.90 and discussed a problem on  $G$ -inverse which has application in the theory of general relativity.

Dr. Alope Goswami (Stat-Math.) lectured in the Winter School on 'Geometry of Tensor products of Banach spaces' held in I.S.I., Bangalore Centre during December 18, 1989—January 4, 1990.

Dr. Aniya Mukherjee (Stat-Math.) delivered two lectures in a seminar dedicated to the memory of Sir Asutosh Mukhopadhyay in the Department of Pure Mathematics, Calcutta University held during June 25-29, 1989. Dr. Mukherjee delivered three lectures in a seminar in the Department of Mathematics, Burdwan University in January 1990.

Dr. Rahul Mukherjee (Stat-Math.) presented an invited paper entitled 'Optimality of balanced designs for minimum norm quadratic unbiased estimation of variance components' at the Professor H. K. Nandi Memorial International Symposium on Statistics and Probability held at the Department of Statistics, University of Calcutta during the period December 22-24, 1989.

Mr. Goutam Mukherjee (Stat-Math.) attended the Instructional Conference on Lie Groups organised by NBHM during June 2-22, 1989 at TIFR, Bombay.

Dr. N. S. Narasimha Sastry (Stat-Math.) attended the International Conference, on invitation, on 'Algebraic Groups' organised at the Central University of Hyderabad between December 7-18, 1989.

Dr. A. R. Rao (Stat-Math.) acted as a resource person and gave a series of lectures on 'Flows in Networks and Applications' in the All India Winter School in Discrete Mathematics conducted by the Department of Mathematics, University of Poona, Pune, during 22—23 November 1989.

Dr. T. P. Tripathi (Stat-Math.) attended an International Conference on Optimization and Statistics held at Aligarh Muslim University, Aligarh during 18-21 December 1989 and presented an invited paper, chaired one session and participated in discussions.

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Dr. R. Bhatia (Stat-Math.) participated and delivered the following talks (i) 'Hardy and Littlewood : Mathematics and Anecdotes' to the Mathematics Society, St. Stephen's College, Delhi, December 1989; (ii) 'Perturbation of roots of polynomials' at the Annual Meeting of the Indian Mathematical Society, University of Delhi, December 1989; (iii) 'A walk through Cantor's paradise' to the Mathematics Society, St. Stephen's College, Delhi University, January 1990.

Dr. K. R. Parthasarathy (Stat-Math.) participated and delivered talks at— (i) U.G.C. Summer School, University of Pondicherry, 5 lectures on elements of combinatorial probability, 15-5-89 to 19-5-89; (ii) Annual Conference of the Indian Mathematical Society 1989 : Heritage of Professor M. H. Stone, 27.12.89; (iii) University of Mysore, U.G.C. Visitor, 22-26 January 1990, A course of lectures on quantum probability.

Dr. B. L. S. Prakasa Rao (Stat-Math.) gave an invited talk on 'Probability Density Estimation and Data Analysis' in a Symposium on 'Mathematics—Queen and Companion of Sciences', Indian National Science Academy, Jaipur, August 1989.

Dr. B. Ramachandra (Stat-Math.) delivered invited lectures (three) at the Department of Statistics, University of Madras, January 4-8, 1990.

Dr. Gadadhar Misra (Stat-Math.) gave an invited talk titled Homogeneous Operators at a mini conference on Harmonic Analysis conducted in the Indian Institute of Technology, Kanpur, January 1990.

Dr. V. S. Sunder (Stat-Math.) delivered lectures on : (a) Hypergroups, invited talk at a mini conference on Harmonic Analysis at Indian Institute of Technology, Kanpur, January 1990 (b) Series of lectures on Recurrence and Number Theory, Summer School for undergraduates, University of Pondicherry, May 1989 (c) Invited speaker at the Functional analysis and operator theory Seminar, University of Cochin, June 1989.

Dr. Alladi Sitaram (Stat-Math.) delivered invited lectures on : (a) The Pompeiu problem, Indian Institute of Technology, Kanpur, January 1990 (b) Instructional Conference on Lie groups, Tata Institute of Fundamental Research, Bombay, June 1989.

Dr. V. Pati (Stat-Math.) : (a) visited TIFR for about seven weeks and delivered lectures on : The Heat Trace of Algebraic 3-folds, Tata Institute of Fundamental Research, Bombay, January-February, 1990 and (b) visited the Institute of Mathematical Sciences, Madras, for a week in December 1989 and delivered a colloquium lecture there.

Dr. S. Ramasubramanian (Stat-Math.) gave an invited lecture on Diffusion and the Neumann problem, Statistics section of the 77th meeting of the Indian Science Congress, Cochin, February 1990.

Dr. Tapas Kumar Basu (Applied Statistics, Surveys and Computing) participated in the 34th Congress of the Indian Society of Theoretical Applied Mechanics at Coimbatore, 27-30 December, 1989.

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Shri Sanjib Kumar Gupta (Applied Statistics, Surveys and Computing) attended 77th Session of the Indian Science Congress Association held at Cochin and presented a paper.

Dr. Partha Pratim Majumder (Applied Statistics, Surveys and Computing) attended XVth Annual Conference of the Indian Society of Human Genetics, Madras, 18-20 January 1989, and delivered an invited lecture on 'Multilocus recessive models in the study of human diseases : Some theory and applications'.

Dr. P. S. S. N. V. P. Rao (Applied Statistics, Surveys and Computing) presented a paper entitled "Group inverses of matrices of order Rank/Perturbation at  $g$ -inverse day" held at ISI Delhi Centre on 9 March 1990.

Dr. Aditya Bagchi (CSSC) delivered a lecture on "Open System Interconnection and Network Protocols" at Coal India Ltd., Calcutta, January 1990.

Prof. P. Bandyopadhyay (Electronics) gave an invited talk on (i) 'Quantum Gravity, Torsion and the Wave Function of the Universe' at the International Conference of Indian Association of General Relativity and Gravitation held in November, 1989 at North Bengal University. (ii) 'Quantum Space-time and Gravity' at the International Conference on 'Supernova 1987' held at BARC, Salt Lake, Calcutta.

Prof. A. Ghosh (Electronics) gave an invited talk on 'Effects of Strong vertical vortices on River Beds' at the CASAMCU National Research Symposium held at Calcutta University during 14-16 March, 1990.

Prof. T. Roy Chowdhury (Geological Studies) on invitation from Jadavpur University, gave a series of lectures in 'Vertebrate Palaeontology' to B.Sc./M.Sc. students of the Geology Department, Jadavpur University.

Dr. D. Saha (Geological Studies) on invitation from Calcutta University, gave a series of lectures on 'Precambrian Stratigraphy' to M.Sc. students of Geology Department, Calcutta University.

Prof. A. B. Gupta (Physics) attended the Eighteenth National Conference of Dermatologists, Venereologists and Leprologists at S.M.S. Medical College and Hospital, Jaipur, during January 18-21, 1990 sponsored by the Indian Association of Dermatologists. He presented two papers on investigative dermatology and participated actively in the special seminar 'Dermatopathology' conducted as a part of the Conference.

Prof. Gupta also attended the National Symposium on Biophysics at the Saha Institute of Nuclear Physics, Salt Lake, Calcutta during February 20-22, 1990 sponsored by the Indian Society of Biophysics, Indian Physical Society and the Calcutta University. He presented a paper 'A biophysical study of psoriasis' in the Symposium.

Dr. D. K. Bagchi (Agricultural Science) attended (i) the National Seminar on "Economics of Land and Water Use" held in Pune during July 1989 and presented two papers. (ii) the International Symposium on 'Natural Resource Management



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for a Sustainable Agriculture" held in Delhi during February, 1990 and presented two papers.

Prof. B. N. Mukherjee (Anthropometry and Human Genetics) attended and presided over the Population Genetics session of XV Annual Conference of the Indian Society of Human Genetics, at Madras during 18-20 January 1990. He also presented a paper entitled "Plasma IgG, IgA and IgM levels in different Polymorphic markers among three populations of Malda district, West Bengal.

Prof. A. Basu (Anthropometry and Human Genetics) attended (i) Annual Conference of the Indian Anthropological Society, Calcutta, during January 1990. (ii) UGC National Seminar on 'Anthropology : Techniques and Methods, University of Delhi, during December 1989 and presented an invited paper.

Prof. Basu also visited Delhi, Vidyasagar and Calcutta Universities and Anthropological Survey of India as an external expert. Prof. Basu acted as external expert for Punjabi University, Patiala and Tirupati University, Andhra Pradesh.

Dr. Ranjan Gupta (Anthropometry and Human Genetics) acted as Guest Lecturer in Vidyasagar University. Dr. Gupta also visited the North-Eastern Hill University, Shillong as external expert.

Dr. Barun Mukhopadhyay (Anthropometry and Human Genetics) acted as Guest Lecturer in Vidyasagar University.

Dr. Biva Karmakar (Anthropometry and Human Genetics) attended the (i) UGC Seminar on New Horizons in Human Biology, held at Punjabi University, Patiala, during 9-10 November 1989 and presented a paper. (ii) XV Annual Conference of Indian Society of Human Genetics, held at Indian Society of Human Genetics, Madras, during 18-20 January 1990 and presented a paper. (iii) International Conference on progress and trends in Dermatoglyphic Research, held at Indian Institute of Bio-Social Research and Development (IBRAD), Calcutta, during 27-29 January 1990 and presented a paper.

Prof. K. C. Malhotra (Anthropometry and Human Genetics) attended the (i) Environmental issues of Common interest, 5th June 1989, Bhubaneswar, delivered a key note address and was state Guest, Government of India. (ii) National Seminar on Tribal movement, tribal unrest and welfare, Bidisha, during 10-12 June 1989, presented a paper and chaired a session. (iii) Workshop on Joint management of Forest Lands, Calcutta, during 18-20 June 1989, IBRAD and West Bengal Forest Department. (iv) Workshop on Forests as living space and Economic factor, Max Mueller Bhawan, during 3-6 December 1989, Bombay and presented an invited paper. (v) International Conference on Genetics and Human Welfare, during 15-20 January 1990, at Madras University, Madras, and presented an invited lecture and chaired a session and was a speaker on panel discussion on Genetic Research in India. (vi) XV Annual Conference of the Indian Society of Human Genetics, at Madras University, during 18-20 January 1990, presented a paper and chaired a session. (vii) International Conference on Progress and Trends in Dermatoglyphic research, IBRAD and ISI, Calcutta during 27-29 January 1990 and presented four papers. (viii) Annual

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Conference of Indian Anthropological Society, Calcutta, during 30-31 January 1990 and presented a paper. (ix) Indo-Soviet seminar on 'Ethnicity, People and Caste, Anthropological Survey of India, Calcutta, during 23-27 February 1990 and presented an invited paper. (x) Seminar on Forest, Forest Dwellers and Forest Development, Gadhiana, during 2-4 March 1990 at Calcutta University, and presented an invited paper and chaired a session. (xi) International Conference on Population and Sustainable Development, Development Alternative, New Delhi, during 20-23 March 1990. (xii) Attended several meetings of DST at New Delhi and Cochin during 1989-90.

Dr. B. M. Reddy (Anthropometry and Human Genetics) participated the following : (i) Colloquium of the former Alexander van Humboldt Fellows in India organized by the Alexander van Humboldt foundation at Madras, during 17-20 November 1989. (ii) The discussion meeting on Human Ecology and Cultural Heritage organized by the Centre for Ecological Sciences, of the IISC, Bangalore at Dharwad University, Dharwad, during 30 November to 2 December 1989 and he presented a paper on the Ecology of Marine fishermen of the Karnataka coast. (iii) International Dermatoglyphics Conference on 'Progress and Trends in Dermatoglyphics Research', organized by IBRAD, Calcutta, during 27-29 January 1990 and presented a paper. He was also an incharge of the Scientific Sessions of the Conference. (iv) Workshop on "Statistical Methods in Dermatoglyphics" at Calcutta during 1-4 February 1990. (v) As a visiting scientist at the centre for Ecological Sciences, Indian Institute of Science, Bangalore, during 25 November to 30 December, 1989.

Prof. R. L. Brahmachary (Embryology) participated and delivered an invited lecture on Chemical Communications in Tiger at the Biochemistry Department, Science College, Calcutta University.

Dr. P. K. Tapaswi (Embryology) participated and delivered two lectures in a workshop at the Calcutta Mathematical Society on "Stochastic Models of Differentiation and Morphogenesis during Embryonic Development.

Dr. Tapaswi also delivered an invited lecture entitled "Order through fluctuations in an Epigenetic model of Transcription and Translation during Embryogenesis" in a Colloquium "Realm of Differentiation" held at the Jawaharlal Nehru University, Delhi, during 2-3 March 1990.

Dr. P. C. Daschudhuri (Entomology) attended ICMR/CICFRI Workshop on Larvivorous Fishes of Inland Ecosystems, during 27-28 September 1989 at New Delhi, and presented a paper.

Prof. D. Dasgupta (Economic Research) addressed a Seminar on "Procurement Price, Market Price, Employment and Effective Demand" at Burdwan University on 3rd August 1989.

Prof. Dasgupta also invited by the State Planning Board of West Bengal to participate in a discussion on the 5th Five Year Plan for the State of West Bengal held at the Great Eastern Hotel, Calcutta, on 10 December 1989.

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Dr. Pradip Maiti (Economic Research) invited by the State Planning Board of West Bengal to participate in a discussion on the 8th Five Year Plan for the State of West Bengal held at the Great Eastern Hotel, Calcutta on December 10, 1989.

Dr. Maiti also chaired a session on "Macroeconomic Issues" at the International Seminar on Economic Growth in Developing Countries and the Quality of Life held at the Jadavpur University during 14-15 January 1990. He was also elected a member of the Executive Committee of the Indian Association for Research in National Income and Wealth.

Dr. Dipankar Coondoo (Economic Research) invited by the State Planning Board of West Bengal to participate in a discussion on the 8th Five Year Plan for the State of West Bengal held at the Great Eastern Hotel, Calcutta on 10 December 1989.

Shri Biswanath Roy (Economic Research) participated in the Seminar of the Bengal Economic Conference and Bengal Chamber of Commerce and Industry in co-operation with the American University Centre at the Bengal Chamber of Commerce and Industry on 26th April 1989. He also attended the 10th Annual Conference of the Bangiya Arthaniti Parishad at Burdwan University during 7-18 February 1990 and presented a paper.

Dr. L. S. Bhat (Planning) (i) participated in the 11th Indian Geography Congress, (NAGI) held at the University of Delhi during 3-5 October, 1989. (ii) Participated in the National Seminar on Panchayati Raj-Decentralised Planning and role of Communication organised by the Centre for Area Development and Action Research, Delhi during 12-13 August 1989. (iii) Participated in the National Workshop on Regional Disparities in Educational Development organised by NIEPA, Delhi during 25-27 September 1989. (iv) Participated in the National Seminar on District Planning organised by the I.I.M., Bangalore during 10-12 May 1989. (v) Participated in the Workshop on Land Resources organised by Wadia College on Commerce, Pune during 22-24 July, 1989. (vi) Delivered lectures on "Resource Inventory for District Planning training programme organised by the Institute of Economic Growth, Delhi during 27 October 1990.

Dr. M. R. Saluja (Planning) (i) As a member of the working group participated 'Projections' by the Department of Telecommunication, Economic Research Unit, Sanchar Bhavan, New Delhi. (ii) Participated in the National Seminar on Labour Statistics Research organised by Labour Bureau during 35-26 May, 1989.

Dr. S. M. Kansal (Planning) Participated in the 17th General Conference of Indian Association for Research in Income and Wealth, held in ISI, Calcutta during 7-9 February 1990.

Dr. R. N. Sharma (Planning) participated in the 12th Indian Geography Congress organised through National Association of Geographers of India by Delhi University during 3-5 October, 1989.

Dr. Partha N. Mukherji (Planning) (i) Participated in the Workshop on Bonded Labour, organised by Lal Bahadur Shastri National Academy, Mussorie and

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National Labour Institute, New Delhi, during 8-9 February, 1990. (ii) Attended the seminar on "Recent Changes in the Communist World and the Future of Democratic Socialism" held at Bharat Yatra Kendra, Bhuvaneshwary (Bhonds) Gurgaon, Haryana, on the occasion of the birth centenary of Acharya Narendra Deva, on 1 March, 1990. (iii) Attended "Nation Building in India" A. R. Sayyad Memorial Lecture delivered in the Jamia Millia Islamia University on 1 February, 1990. (iv) Gave a talk on Backward Forward Linkages and the Indian Economy on February, 1990 to the participants of the Second Refresher Course in Economics organized by the J.N.U. New Delhi. (v) Gave a talk on Centre-State Financial Relations on September 22, 1989 to the participants on the first Refresher Course in Economics organised by the J.N.U. New Delhi. (vi) Participated in the TV Panel discussion on Railway Budget organized by the Delhi Doordarshan on 14 March 1990.

Dr. Atul Sarma (Planning) (i) Attended the International Seminar in Public Economics held in New Delhi during 11-13 January 1990 and contributed as a discussant. (ii) Attended the Seminar on Development Experiences in large Economies : China and India. Reforms and Modernization organized by the Indian Council for Research on International economic Relations in collaboration with the London School of Economics at New Delhi during 15-16 January 1990 and contributed as a Panellist. (iii) Participated in the Round Table on Issues relating to Industrial and Trade Liberalization and Export Growth organized by the National Institute of Public Finance and Policy, New Delhi on 23 January 1990. (iv) Participated in the meeting organized by the Social Scientist in New Delhi during 7-8 August 1989. (v) Participated in the Seminar on State of the Economy : Current challenges organized by I.P.A., New Delhi, on 30 January 1990.

Dr. N. S. Iyengar (Economic Analysis) (i) Participated in the ICSSR Course in Research Methodology (1989) in the Institute for Social and Economic Change, Bangalore on 29 May 1989 and delivered the Valedictory Address of the Course Theme "Use of Econometrics in Designing Policy". (ii) Visit to the Department of Addressing the students on "Measurement of Poverty and Inequality" in the Department of Economics, Madurai University, Madurai on 19 November 1989. (iii) Visit to the College and addressing the students and Staff on "Analysis of Income Distribution in India" in the Lady Doak College and Madurai University on 20 November 1989. (iv) Attended Twenty-sixth Indian Econometric Conference in the Department of Economics, Aligarh Muslim University, Aligarh on 4 January 1990 and presented a paper entitled "A Test for Expenditure Elasticity Estimates from Survey Data". (v) Attended Two-day seminar on Teaching of Economics, in the Institute for Command Studies and Irrigation Management, Bangalore, and Indian Economic Association Trust for Research and Development during January, 1990. (vi) Gave the course of Lectures under the UGC Visiting Fellow Scheme, in the School of Economics, Madras University, Madras on 8 February 1990. (vii) Gave the special lectures on Quantitative Methods in Economics under their Contact programme, in the Institute of Correspondance Course and continuing Education, University of Mysore, Mysore on 6 February 1990. (viii) Attended the seminar on 'India's Development Experiences—Lessons, Problems, Prospects', in the Development of Economics, Bharatidasan University, Tiruchirapalli on 24 March 1990.

Dr. Alokanda Mitter (Linguistic) (i) visited Delhi University during 23-29 July 1989 and held discussions with experts on the Hindi language. (ii) Chaired the

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session on Technical Development at the Annual Seminar of the Ali Yavar Jung National Institute for the Hearing Handicapped at Bombay held on the 5-6 December 1989, and she also participated in discussions with the Director and the members of the staff of AYJNIHH, Bombay. (iii) Attended the Annual Conference of the Indian Speech and Hearing Association held at the All India Institute of Medical Sciences, New Delhi, during 10-13 February 1990, and she was the chief speaker at the special Pre Conference Seminar on S.A.F.A. during 8-9 February 1990.

Mr. Amitav Choudhury (Linguistic) (i) Visited Delhi and Aligarh between 23 July 1989 to 1 August 1989. While in Delhi he recorded data for instrumental analysis at CEERI and Delhi University. At the Aligarh Muslim University in consultations with faculty members of the Physics Department, he spectrographically recorded data on Hindi and Oriya suprasegmentals in their Electronics Laboratory. (ii) Visited Hyderabad to assist Dr. A. Mitter in the collaborative on Telugu Suprasegmentals. He also held consultations with experts working in the area of Bilingual Measurement at the Centre of Advanced Study in Linguistics, Osmania University, C.I.E.F.L., and the Telugu Academy, Hyderabad.

Smt. Madhabi Indu (Linguistic) attended the Annual Conference of the Indian Speech and Hearing Association held at the All India Institute of Medical Sciences, New Delhi during 10-13 February 1990.

Prof. S. Guba Roy (Population Studies) (i) participated in the South Asian Regional Conference, during 16-18 September 1989 at New Delhi, and he acted as discussants in two sessions of the Conference. (ii) Attended the XXI International Population Conference, IUSSP, during 26-27 September 1989 at New Delhi. (iii) Attended the Conference on Indian Population Problems in Prospect-and Retrospect (a Post-Congress Session to the XXI International Population Conference, Delhi), on 30 September 1989 at Calcutta.

Prof. C. R. Malaker (Population Studies) (i) participated in the South Asian Regional Conference, during 16-18 September 1989 at New Delhi, and he acted as discussants in two sessions of the Conference. (ii) Attended the XXI International Population Conference, IUSSP, during 26-27 September 1989 at New Delhi. (iii) Attended the Conference on Indian Population Problems in Prospect-and Retrospect (a Post-Congress Session to the XII International Population Conference, Delhi), on 30 September 1989 at Calcutta.

Prof. B. N. Bhattacharya (Population Studies) (i) participated in the South Asian Regional Conference, during 16-18 September 1989 at New Delhi. (ii) Attended the XXI International Population Conference, IUSSP, during 26-27 September 1989 at New Delhi. (iii) Participated in the Project Advisory Committee meetings on children studies held at Bhopal Gas Disaster Research Centre, Bhopal (Indian Council of Medical Research) during 16-17 May, 1989. (iv) Attended a meeting relating to the study on Reproductive Function of Females Exposed to Toxic Gas at Bhopal, at BGDRS (ICMR), Bhopal during 15-16 January 1990.

Dr. P. K. Majumdar (Population Studies) participated in the South Asian Regional Conference, during 16-18 September 1989 at New Delhi. (i) Attended the XXI

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International Population Conference, IUSSP, during 26-27 Septembr 1989 at New Delhi. (ii) Was invited to present a paper in a National Seminar on Role of NGOS in Rehabilitation of Child Labour in India, organised by the Council for Tribal & Rural Development at Bhubaneswar, during 2-3 February 1990. Paper entitled "Working Children in Calcutta". (iv) Participated in the National Seminar on "Factors Affecting PHC performance in Family Welfare", organised by the Field Unit of the Population Centres, Bangalore at Gulbarga, Karnataka, during 29-30 January 1990 and presented a paper entitled "Factors Affecting Sterilisation in Tank, Rajasthan : A case study through focus group discussion technique". He also worked as a rapporteur for the Seminar.

Sri B. K. Mukhopadhyay (Population Studies) attended the XXI International Population Conference, IUSSP, during 26-27 September 1989 at New Delhi.

Smt. Anjali Ghosh (Psychometry) acted as a Recorder at the session "Alleviating Human Suffering" at the 27th Annual Conference of the Indian Academy of Applied Psychology at Aligarh in January 1990.

Shri, K. P. Bhattacharyya, Shri S. N. Banerjee and Shri S. K. Mitra (Psychometry) actively participated in a two-day seminar on "Attainment level of primary students at the end of Class-IV in West Bengal" organised by State Council of Educational Research and Training, Government of West Bengal, during 13-14 June, 1989.

Dr. S. Bandyopadhyay (Sociology) attended (i) Seminar on "Economics of land and water resource in India", Pune, 22-24 July 1989. (ii) International Symposium on Natural Resource Management for a Sustainable Agriculture, 6-10 February 1990. (iii) Workshop of HFCL's Resource Planning and Training Institute, Durgapur, during March 26 to April 6, 1990. (iv) Workshop on sustainable technology for rainfed farming in eastern plateau. XISS, Ranchi, during 10-12 January, 1990.

Dr. Bandyopadhyay also acted as Discussant in Session 4, "Risk Adjustment Strategies" of the International Symposium on National Resources Management for a Sustainable Agriculture, held on 9 February 1990 at New Delhi, organised by Indian Society of Agronomy and IARI.

Mr. A. K. Maiti (Sociology) attended (i) International Symposium on Natural Resources Management for a Sustainable Agriculture, during 6-10 February, 1990, New Delhi, sponsored by Indian Society of Agronomy and IARI. (ii) Workshop on Sustainable Technology for Rain-fed Farming in Eastern Plateau, XISS, Ranchi, during 10-12 January 1990. (iii) Post Congress Seminar, "Forest, Forest Dwellers and Forest Development", Calcutta University, at Gadiara.

Mr. P. Chakrabarti (Sociology) attended (i) "Coast Zone Management Workshop", Jadavpur University, during 15-16 December 1990 organised by Explorer's Institute. (ii) "Multisectoral Development with Social Justice Workshop" at Haturia Gram Panchayat, Bagnan, West Bengal, during 12-18 February 1990, organised by AVARD Foundation for Rural Development.

Mr. K. M. Date and Mr. G. M. Rao (SQC and OR) delivered a series of lectures on invitation from College of Engineering, Pravaranganar and Viswakaran Institute of Technology, Pune, on Statistical Methods and Quality Control.

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Shri R. Anantha Rao (SQC and OR) delivered invited talks on (i) Quality Management in Kannada at Klas Engineering Works, Bangalore on 22 April 1989; (ii) statistical process control at Usha Hydraulics Ltd., Hosur Road, on 29 April, 1989; (iii) statistical process control at Hindustan Aeronautics Ltd., Staff College on 26 May, 1989; (iv) Accuracy and Prediction of Measurements of Foreman Training Institute, Bangalore on 8 August 1989.

Shri A. Roy Choudhury (SQC and OR) delivered lectures on (i) Design of Experiments at Electronics Division of BHEL on 19 June 1989; (ii) Standard Designs at Bureau of Indian Standards on 29 June 1989; (iii) Reliability Engineering at DGQA Headquarters on 11 July 1989; (iv) Acceptance Sampling at Electronics Division, BHEL on 17 July 1989; (v) Frequency Distribution at Widia Ltd., on 14 August 1989.

Shri U. H. Acharya (SQC and OR) gave invited talks on (i) Design of Experiments and Orthogonal Arrays at Bureau of Indian Standards during June 1989; (ii) Process Capability and Allied Topics at DGQA on 12 July 1989; (iii) The New Seven Tools at TVS Electronics on 6 December 1989.

Shri K. K. Chowdhury (SQC and OR) gave talk on Design of Experiments at Bharat Electronics Ltd., on 12 September 1989.

Shri A. K. Chaudhuri (SQC and OR) gave invited talks on (i) Quality Management, at National Institution for Quality and Reliability, Trivandrum Branch on 28 November, 1989; (ii) Quality Management for Non-QC Personnel at KELTRON, Trivandrum during 28-29 November 1989; (iii) Total Quality Development in India in an International Perspective at NIQR, Bangalore Branch on 17 January, 1990.

Shri M. V. Lakshmana Samy (SQC and OR) delivered (i) four invited lectures on Acceptance Sampling at Export Inspection Agency, Bombay, on 30 June, 29 August, 1 December 1989 and 2 February 1990; (ii) On Packaging QC criteria for sampling and sampling plan for variables and attributes at Indian Institute of Packaging on 17 November 1989.

Shri M. V. N. Sapre (SQC and OR) gave an invited talk on SQC at Indian Oil Corporation on 16 January 1990.

Shri M. V. Lakshmana Samy (SQC and OR) attended (i) the Post Congress Conference of ACQR at Bombay on 7 November 1989; (ii) Seminar on Harmonisation of Standards, Certification and conformance Testing—European Approach and their Impact on India, at Bureau of Indian Standards, Bombay on 10 March 1990.

Shri V. Ramchandradu (SQC and OR) attended (i) the Post Congress Conference of ACQR at Bombay on 7 November 1989; (ii) Seminar on Harmonisation of Standards, Certification and conformance Testing—European Approach and their Impact on India, at Bureau of Indian Standards, Bombay on 10 March 1990.

Shri V. D. Paluskar (SQC and OR) attended the Post Congress Conference of ACQR at Bombay on 7 November 1989.

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Shri V. Gopalan (SQC and OR) gave invited talks (i) SQC Seven Toolsat Quality month Celebration of Lakshmi Machine Works on 8 April 1989; (ii) Introduction to Quality Cost concept at Confederation of Engineering Industries, Trichy on 24 January 1990; (iii) attended the Post Congress Conferdeation of ACQR at Bangalore during 6-7 November 1990.

Shri S. K. Majumdar (SQC and OR) (i) attended and delivered a lecture at the Post Congress Conference of ACQR at Calcutta on 4 November 1989. (ii) Attended 5th National Convention of Metallurgists and Future—Indian Scenario, at Calcutta during 9-10 March 1990. (iii) Attended National Conference on standardisation at Institution of Engineers and BIS, at Calcutta during 30-31 March 1990.

Dr. Rajendra Prasad (SQC and OR) gave a talk on (i) Efficient solutions of time-cost trade off bicriterion transportation problem, at Indian Institute of Science, Bangalore on 29 September 1989; (ii) Optimisation methods at OR Society and Institute of Engineers joint meeting on 4 October 1989; (iii) Waiting Line Models and Simulation at Foremen Training Institute, Bangalore on 6 October 1989.

Shri S. M. Ibrahim (SQC and OR) gave an invited talk on Quality of Hosiery yarn at Vadivaniagai Textile Mills on September 1989.

Shri P. K. Perumallu (SQC and OR) delivered a few lectures on Quality Improvement and Reliability Engineering at Electronics Division of BHEL in November 1989.

Shri S. P. Mukherjee (SQC and OR) delivered a lecture on Probability Criteria at Regional Labour Institute, Calcutta on 27 September 1989.

Dr. R. J. Pandey (SQC and OR) gave invited talks on (i) Quality Circle at ETRL, at Calcutta on 27 May 1989; (ii) Basic Statistics, Adaptive Control and EVOIP to IAPQR Diploma Students during September—October, 1989; (iii) Operational Research a Universal Strategy for Decision Making at Advanced Research Centre for Applied Mathematics on 15 March, 1990.

Shri S. K. Chaudhuri (SQC and OR) delivered (i) a series of 5 lectures on Application of Statistical Methods in Medicine and clinical Research at Radiotherapy department, R. G. Kar Medical College and Hospital during July—August, 1989; (ii) a talk on Role of Statistical Designs in Clinical Trials at a seminar of Radiation Oncologists Association on 20 November 1989.

Shri A. N. Nankana (SQC and OR) delivered lectures on (i) Total Quality Control—Management Role, at a seminar on Management of Quality, Pune during 16-18 May 1989; (ii) Role of Management in Promoting Quality as a way of Life at Hindustan Aeronautics Ltd., on 27 June 1989; (iii) Concept, Practice and Reward of Quality at DGQA on 28 April 1989; (iv) Process Control at IAQR on 7 October 1989.

Shri S. C. Chakraborty (SQC and OR) delivered talks on (i) Company Wide Quality Control at HMT Ltd., Pinjore on 23 April 1989; (ii) Product Improvement—Teguchi Methods at AIQR, New Delhi on 29 July 1989; (iii) Total Quality Management—challenge and Task Ahead at J. K. Synthetics Ltd.