

Modern industrial development could sometimes be considered as a curse in view of the different health hazards involved in such industrial developments. But ecofriendly developments are blessings to us. R. D. Khulbe and L. S. Bisht have summarized the importance of environmental health awareness programme in such projects.

Finalization of the project report by D. P. Joshi *et al.* highlighting the whole project implementation programme with particular emphasis on the importance of planning and sustainable use, is unique.

The efforts displayed by the project staff in aggregating the womenfolk and forming different women's organizations like Mahila Mangal Dal and Pani Panchayat are worth emulating.

Most of the photographs are well-printed and to the point. The book begins with detailed contents and ends with the appendix indicating the names of the CHEA project staff and the project management committee, as well as the list of contributors who are well-experienced in their respective work.

The publishers deserve commendation

for publishing this book which has a large audience.

The Ford Foundation has really chosen the right organization with the right persons in advancing the grant for this kind of social work and basic research.

DEVASHISH KAR

*Department of Life Science,  
Assam (Central) University,  
Silchar 788 005, India  
e-mail: koel@dte.vsnl.net.in*

## PERSONAL NEWS

### Chanchal Kumar Majumdar (1938–2000) – *An obituary*

Chanchal Kumar Majumdar, an exceptionally gifted condensed matter physicist, passed away in Calcutta on 20 June 2000. His death was so unexpected that it came as a rude shock to the scientific community.

Majumdar had a brilliant academic record in Krishnanagar and Calcutta. Subsequently he obtained his doctoral degree in physics from University of California, La Jolla in 1965 under the supervision of Walter Kohn who went on to win the Nobel prize in Chemistry in the nineties. With Kohn he proved a theorem (the Kohn–Majumdar theorem) on the continuity of the bound and unbound states of the Fermi gas. From 1965 to 1966, Majumdar held a post-doctoral position in Carnegie Institute of Technology (now called Carnegie-Mellon University), Pittsburgh before joining the Tata Institute of Fundamental Research (TIFR) in Mumbai. From TIFR, he had another post-doctoral stint in the University of Manchester. In Pittsburgh and Manchester, Majumdar came in contact with stalwarts like James S. Langer and Sam F. Edwards, though he chose to work independently on the analytic properties of the Onsager solution of the Ising model and non-exponential stress relaxation in glasses.

TIFR days were the most productive for Majumdar. He had a group of several bright students and with them, he tackled a variety of problems with deep mathematical insight. They include the three-

magnon bound state equation, Heisenberg antiferromagnetic chain with known ground state, the critical isotherm of the Ising model and of the Lennard–Jones gas, the band structure of cerium, spin waves in finite magnetic chains, etc. It is interesting to note that during those days in India, what we now know as condensed matter physics was dominated by lattice dynamics. Majumdar was a rare



exception amongst his peers. He was well-versed in then-current subjects of statistical mechanics and critical point phenomena, and their applications to electron states and magnetic properties of solids.

Perhaps the most important contribution of Majumdar for which he is internationally known is the work (with Dipan Ghosh in 1969) on the exact enumeration of the ground state of an anti-ferromagnetic

chain, with specially ascribed values for nearest neighbour and next nearest neighbour interactions. This work on what is now part of the folklore as the Majumdar–Ghosh Hamiltonian is a wonderful illustration, as it were, of how open-ended basic research can be. Almost two decades later the model led to a prototype ‘resonating valence bond’ state, in the context of high temperature superconductivity. One other point is noteworthy here. The years 1965 to 1975 had not yet seen the growth of computational physics as is extant in India today; Majumdar indeed was a pioneer computational physicist of our country. In 1976, he was awarded the Shanti Swarup Bhatnagar prize in Physical Sciences, and in the same year was elected Fellow of the Indian Academy of Sciences.

The decade from 1976 to 1986 marked a new phase in Majumdar's life. As Palit Professor of Physics in Science College of Calcutta University and Head of Magnetism/Solid State Physics Department of the Indian Association for the Cultivation of Science (IACS), he devoted himself to education, teaching and curriculum development. In addition, he switched interest to down-to-earth experimental studies, applying his early work (1965–1970) in the theory of positron annihilation spectroscopy to radiation damage, and also involving Mössbauer spectroscopy of corrosion and inhibition of iron ores in eastern India. His other experimental contribution included the enhancement of