

In this issue

Transport

Transport is a necessity which we all use in different ways every day. There is increasing concern that in India the development of transport infrastructure and facilities has not taken place in an optimal and satisfactory fashion, keeping pace with and catalysing our economic growth. In the special section on transport (page 778–828), Raman and Anantharamaiah (page 778) discuss the main policy issues pertaining to the problems of transport in this country. They suggest areas where policies can be changed to evolve a better framework for private sector participation in, and the efficient development and technological enhancement of, the sector.

Sriraman (page 785) describes the evolution of the road transport industry, which has become the dominant mode in India's transport network. He discusses the problems facing the industry and the urgent need to effect technological improvement in design and manufacture of vehicles. Padam (page 790) explains why regulation exists for all modes of transport and presents the viewpoint that additional regulation is required, not less, particularly in road transport. However, regulatory mechanisms have to be modernized. Tillotson, Kerali and Odoki (page 795) provide an overview of HDM4, the most recent highway development and management model that has been evolved. The introduction of such methodologies is necessary in India in order to maintain roads properly and to decide on road investments (both capital and maintenance) objectively.

Ramaswamy (page 800) emphasizes the role of rural roads and rural transport in the country's development. He explains how attention to these matters could improve economic conditions in rural India.

Nanjundaiah (page 804) discusses the environmental impact of transport and the measures that could be taken to reduce environmental damage by road transport.

Raman (page 812) discusses how neglect of shipping, shipbuilding and ports can have serious long-term adverse effects on our economy. He calls for an attitudinal shift in our approach towards modernization of the sector and examines the areas where development can take place in sea ports, shipping and inland water transportation. Verghese (page 818) presents the background to the current organizational structure of the Indian Railways. He discusses the strengths and weaknesses of the system and the areas where improvements are necessary, if the Indian Railways are to reverse their current state of decline.

Subramanya (page 824) explains that this mode needs to be used more intensively in India, as it is a viable method of transporting several commodities. Mathur (page 827) has briefly highlighted the main areas where technological modernization is necessary in the Indian civil aviation infrastructure.

Vijay Raman
K. M. Anantharamaiah

Programmed cell death

In the majority of higher eukaryotic species, a sophisticated network of events controls the death of specific cell types at different phases in the life cycle of the organism. This process of programmed cell death or apoptosis as it is now commonly called, is responsible for a variety of phenomena such as the proper development of the nervous and immune systems, organogenesis during embryonic development and emergence of digits in the limbs, as well

as the removal of abnormal cells. Apoptosis is distinct from necrosis, which is cell death due to loss of membrane integrity as a consequence of physical, chemical or osmotic damage to the cell. Apoptotic cell death is regulated by specific genes, enzymes and signalling pathways. Disregulation of these mechanisms can result in malformations during development and increased predisposition to cancers. Recent studies in the field have led to considerable insights into the activation of specific genes during apoptosis, and the role of enzymes such as endonucleases and proteases in the process. These have been reviewed by N. Panneerselvam on page 829 of this issue. The model organism for the genetic analysis of apoptosis has been the nematode *Caenorhabditis elegans*. Distinct classes of genes essential for the process have been identified in this organism, and homologs of these genes have been found in mammalian cells. Considerable attention has been focused on a family of conserved cysteine proteases called caspases which are activated during apoptosis and have been proposed to cleave key proteins in the cell. With the identification of caspases as the principle triggers of apoptotic events, a complete understanding of the mechanism of apoptosis is now within reach.

Veena K. Parnaik

Climate instability

A lake that was formed nearly forty thousand years ago close to India-Tibet border across the Great Himalaya due to damming by glacial moraines of the main branch of the Ganga River not only marks an event of regional geological import

but also records a pattern of climate change in the past. Interestingly, in several areas of central and north-western Himalaya, rivers got ponded following reactivation of faults and gave rise to lakes in about the same period, 35,000 to 40,000 years before present. The palaeolakes recently recognized in eastern Kumaun (Pithoragarh), south-central Kumaun (Nainital and Bhimtal), south-eastern Ladakh (Tsokar) and south-western Ladakh (Lamayuru) seem to be the close contemporaries of the Goting palaeolake described by R. K. Pant *et al.* (page 850). The Goting lake also happens to be located on a very active fault that de-

tached the Tethyan sedimentary pile from its foundation of crystalline rocks that make the Great Himalaya. Various deformation features in the lake sediments described by the authors tend to show that movements continued on these crucial faults for quite some time. However, the authors hold an altogether different view about the formation of these features.

The Goting lake disappeared 20,000 years ago when the Last Glacial Stage was at its peak. The magnetic susceptibility study demonstrates that there were brief interludes of relatively warmer-wetter phases in an otherwise intensely

cold climate condition – the oscillation occurring with regularity at 39, 33, 29, 26, 24 and 23 thousand years before present. Studies carried out by my colleagues on Kumaun palaeolakes 100–150 km south of Goting reveal temperate-humid phase prior to 31, 27–26, and 24–18.5 thousand years before present alternating with hot-arid climate. It seems that there was a common mode of the development of lakes in the Himalaya, and a pattern of climatic changes when the lake came into existence in the late Quaternary.

K. S. Valdiya

ASTRA

WORKSHOP ON PHARMACOKINETICS

10–13 JANUARY 1999

(Number of participants limited to 20)

Course Instructor: Professor Johan Gabrielsson of Sweden

Prof. Gabrielsson's workshop is an internationally acclaimed course being conducted for the first time in India.

Registration Fee: Rs 40,000/- The fee includes 5-star hotel accommodation, lunches, dinners, as well as course material and the use of computers. **Non-residential fee Rs. 10,000/-** which excludes hotel accommodation and dinners.

The hands-on workshop is intended for researchers engaged in preclinical research in pharmaceutical R&D environments. The workshop is open to scientists from pharmaceutical industry preferably with at least 5 years experience in any aspect of preclinical sciences. Applications are invited from interested scientists to reach the Director, Astra Research Centre India, P.O. Box 359, Malleswaram P.O., Bangalore 560 003 on or before 15 November 1998. Selected candidates will be notified before 15 December 1998.

N.B.: All candidates must be sponsored by the R&D Division of their company and bear all costs of travel and Registration Fee.

A recommendation letter by the head of the department and a letter from an authorized official of the company stating that the company will bear costs of travel and registration must accompany the application.