

In this issue

Light and life

Ahmed Zewail of California Institute of Technology (USA) delivered the Rajiv Gandhi Science Lecture (2002) in Bangalore. The text of the lecture appears on **page 29**. Zewail, a Nobel Laureate, traces the history since ancient civilizations that made light part of human life. A part of human life often encourages human curiosity and so does grow the science dealing with light—be it the theory of reflection and refraction, or the theory on the propagation of light waves, or be it the duet of the Maxwellian and Einsteinian paradigm. The search for truth proceeds toward the direction of knowledge from ignorance.

Salim Ali's bat

One of the rarest bats of the world, Salim Ali's 'fruit bat', is currently found in Kardona Coffee Estate in Tamil Nadu only. The bat, *Latidens salimalii*, occupies a secretive habitat in the High Wavy Mountains near Madurai. A total of 28 individuals of this rare species are marked and measured (**page 24**). Knowledge of day-time hideouts and foraging behaviour awaits further study.

Gold nanoparticles

Biomimetics, and information contained within biological patterns, are useful for assembling nanoparticles into a three-dimensional structure. Kumar *et al.* (**page 71**) report the assembly of gold nanoparticles in solution, that has remained a difficult and relatively unexplored area. Sulphur-substituted DNA, as in phosphoro-

thioate DNA, is used to cross-link the gold nanoparticles in solution through thiolate linkages. The UV-visible and FTIR spectra monitor the incorporation of nanoparticles into the structural interconnects. The shapes of particulate organization are investigated with the TEM measurements.

Polymorphic heat shock protein

It is estimated that 64% of the leprosy patients live in India. Leprosy is an immunological disease, caused by chronic infection of *Mycobacterium leprae*. 'Typing' of various *M. leprae* strains has been attempted using molecular DNA technology. A. K. Shabaana *et al.* report (**page 64**) a single site polymorphism of a 18 kDa protein, a heat shock protein antigen, as a determinant marker.

History of the Himalayas

The strength of the summer monsoon in the Indian subcontinent is regulated by the glaciation in the Himalayas. Naturally Indian climatologists and oceanographers are focusing their interests in understanding history of the Himalayas. The salinity and temperature-dependent variations of the $\delta^{18}\text{O}$ preparation in the planktonic foraminifers in the Bay of Bengal are reliable indicators of the climatic changes. The profile is obtained from a core (5.4 m) retrieved during the 31st expedition of *ORV Sagar Kanya* from the Bay of Bengal. On **page 90**, O. S. Chauhan presents a study of the palaeoclimatic changes in the Himalayas, based on high resolution $\delta^{18}\text{O}$ records in the ^{14}C -dated core from the bay.

He concludes that at least two significant episodes of aridity and glaciation have occurred in the Himalayas during Mid-Upper Holocene period.

Wheat transgenics

Chugh and Khurana (**page 78**) report transgenic wheat plants that are herbicide resistant. One-month-old 'basal segment calli' are bombarded with a construct containing the *bar* gene conferring herbicide resistance. In another set of experiments, *Agrobacterium*-mediated transformation is carried out. Transformation efficiency of 4% and 7.5% is obtained in the case of bolistic-mediated gene transfer and *Agrobacterium*-mediated transformation respectively. The two varieties of bread and emmer wheats used in the experiment do not show any appreciable difference in transformation efficiency. The incorporation of the transgene is confirmed by Southern hybridization.

Palaeoatmospheric CO₂ concentration

Mehrotra *et al.* (**page 93**) describe a method to estimate CO₂ concentration in primitive atmosphere. Stomatal index analysis is used to derive the CO₂ level based on the index of the fossil leaf cuticles. The calibration plot for the estimation of CO₂ is carried out by plotting stomatal index versus CO₂ concentration. Knowledge of CO₂ concentration obtained by this method will indirectly help the estimation of changes in global temperature.

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