In this issue

Rural power

Urban energy requirements in India have been growing with every passing day. For households lighting and cooking requirements are paramount, although there is an increasing load for pumping water. Rural India still remains, in large part, woefully short of the power that is needed for uplifting living standards. Modern science and technology have made only a limited impact on the rural energy scene. The use of science and technology for rural development has been the subject of endless seminars and discussions for several decades. On **page 437** Rajvanshi revisits the problem suggesting possible ways in which new and emerging technologies, biotechnology amongst them, can be used to address the unique requirements of rural India. His prescription rests on the argument that the focus should shift from tinkering with inefficient technologies to adapting new and sophisticated technologies.

Genetic variation at microsatellite loci

A billion strong India is considered as a mosaic of different genetic population with acknowledged 4635 distinct communities. Several studies have been carried out based on classical genetic markers to understand the genetic variations among the Indian population. Kashyap *et al.* (**page 464**) report the powers of the STR markers to assess the nature and extent of variations at fifteen microsatellite loci in Indian populations comprising 3647 individuals selected on the basis of ethnicity, prevalence of endogamy and anthropological significance. These 54 populations belonged to Mongoloid, Caucasoids and Australoids and were geographically, linguistically and ethnically distributed covering different parts of India. The distribution of allele frequency at fifteen microsatellite loci shows a very high degree of polymorphism. On the basis of microsatellite diversity, the Dravidians and Tibeto-Burmans appear well differentiated from Austro-Asiatic and Indo-Europeans. The south and central Indian populations are genetically closer than populations of other parts of the country. The Indian populations harbour much greater genetic diversity than most of the populations of the world. While reinforcing the assertions of Indian anthropologists, this study also has a major implication in understanding population dynamics and establishing disease association.

Seyed E. Hasnain

Hypoxia and haemoglobin

The binding of oxygen to haemoglobin is critically dependent on the partial pressure of oxygen. At high altitudes, diminished oxygen binding can result in hypoxia and consequent physiological stress. Several studies of haemoglobin have demonstrated the effects of mutations on the affinity for oxygen, laying open the possibility that adaptation to high altitudes may have a genetic correlate. On **page 502** Qadar Pasha *et al.* report on a study of the arterial oxygen saturation on a population of permanent residents of Ladakh. They have chosen a remarkable population; inhabitants of altitudes of ~ 5400 m, monks who led a physically active life. For controls, the authors chase a population who largely lived at ~ 3600 m with a comparatively sedentary lifestyle. Their findings are interesting; the population of high-altitude monks show a higher level of oxygen saturation of arterial haemoglobin, conferring on them a selective advantage in maintaining physical activities in this extreme environment. A molecular analysis might provide further insights.

Estimation of minerals in Indian coals

A number of problems, like corrosion and erosion, that arise during boiler operations are caused by minerals like quartz and pyrite and inorganic constituents in coal, although coal by itself is soft. Quantitative description of the mineral matter in coal is thus important. Methods such as X-ray diffraction (XRD), X-ray fluorescence spectrometry, scanning electron microscopy, small angle X-ray scattering are being routinely used for quantitative evaluation of the minerals in coal. X-ray computer tomography is yet another technique that 'can be used to detect, locate and size components with differing densities in specimens'. 'Of the techniques available, XRD is the most specific, in that it is based on the unique characteristic diffraction of X-rays from the crystal structure of each mineral. This was however, at best, semi-quantitative because of the problems of imperfect crystalline phases, particularly prevalent in clay minerals. The development of XRD analysis based on the Rietveld full profile enabled coal mineral quantitative analysis. This has been achieved with the development of SIROQUANT™, a computer software package capable of accurate multiphase analysis'.

Maity *et al.* (**page 506**) have presented quantitative results of analyses of samples of coal from Raniganj, South Karanpura, Singrauli and Pench-Kanhan coalfields based on data obtained by XRD technique, 'as an initial step'. They have used the SIROQUANT™ software for this purpose.

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