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Modular planning of the Taj

Balasubramaniam (**page 42**) presents new insights on the modular planning of the Taj Mahal complex, one of the most visited and well-known archaeological structures of India. This is also one of the wonders of the modern world. The Taj Mahal complex is planned based on ordering of grids, with the main architectural features of the complex placed on bilaterally mirror symmetry along the north–south axis. The dimensions of the various sections (the riverfront terrace, the gardens, the forecourt and the caravanserai) of the complex have been analysed using new knowledge on the traditional unit of length measure (the *angulam*) of the subcontinent. Dimensional analysis has revealed that the modular planning of the Taj Mahal complex was executed using the traditional measurement units mentioned in *Arthasastra*, in particular the *vitasti* measuring 12 *angulams* of 1.763 cm. The riverfront terrace and garden

sections of the complex were planned using a grid of 90 *vitasti*, while the forecourt and caravanserai sections using a grid of 60 *vitasti*. The logical numbers that result for the dimensions have been analysed to reveal the ease of division of these numbers into symmetric elements to understand quadratic division of space of the garden area and the triadic division of space of the mausoleum, including decimal divisions. A novel approach to understand the metrology of historical architectural structures of the Indian subcontinent is revealed. More importantly, this study has confirmed that traditional design principles and civil engineering skills of the Indian subcontinent were utilized in the construction of Taj Mahal.

Tourism in Sikkim Himalaya

In the hills of Himalaya developmental avenues are very limited; tourism which has all ingredients of its development inherent in the tranquility, sacredness, richness and uniqueness of natural endowments, and cultural and biological diversity of Himalayan environments – is emerging as a sector of great potential for economic development. Tourism in Sikkim Himalaya is of special significance due to uniqueness of experience it provides – its pristine and unspoiled environments, rich biological diversity, and the aura of Buddhism. The state government is promoting tourism as a priority sector through development of infrastructure, institutionalization, capacity building, organization of fairs and festivals, and system of environmental fees and permits. The government endeavour is well supported by the active participation from the NGO sector and community organizations. The tourism in the state has witnessed spectacular growth with tourist number escalating from 15,000 in 1980 to 350,000 in 2007. Such trends of growth also have negative implications for the host environment and the sustainability of tourism. Joshi and Dhyani (**page 33**) review the tourism situation of Sikkim (India) in an interdisciplinary manner by use of grow-impact models, scenario simulations and integration of data-sets from other sectors of the environment. Tourist inflow trends have been projected for the next 10 years for visualization of impacts; trends of human population, and livestock and agricultural production also analysed for manifested impacts and changes arising from tourism, and for their combined synergies for implications on the broader environment and sustenance of tourism. The article will add to the existing knowledge base/debate, on the tourism–environment interface.

Supercritical CO_2

Substance above its critical temperature and critical pressure is defined as a supercritical fluid (SCF). Critical points represent the maximum temperature and pressure at which vapour and liquid co-exists. This is known since 1822 while Baron Cagniard de LaTour demonstrated the existence of the critical point using equipment originally designed by Denys Papin in 1680. In spite of that applications of SCFs explode on both academic and industrial areas only 20 years ago and still growing. There are few features, which make SCF different from usual fluids. It moves like a gas but dissolves things like a liquid. High penetrating capability with almost no surface tension makes it miscible at highest extent with respect to conventional fluids. Maximum heat capacity at critical point makes it suitable for exothermic reactions like oxidations, polymerizations, etc. Such impressive powers of SCF are attractive for application in a chemical reaction. Proper solvent choice not only can alter reaction kinetics, but also can contribute in sustainability development, therefore it should have much larger impact in today's robust industrial growth in India. However, the research in India is still in level of infancy. Munshi and Bhaduri (**page 63**) cite the examples of the industrial activities and challenges that are considered under the heading SCFs and their scientific implications. The development starting with first commercial utilization in decaffenation of coffee beans under supercritical CO_2 based on the work of Kurt Zosel in the early 1960s till recent time gives a total overview to the scenario of present state of research.