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Conservation without Sorrow

Ashoka is mentioned in mythological texts like the *Ramayana*, where it reduces the sorrow of Sita. By the time Emperor Ashoka took a vow to rule without causing sorrow, the Ashoka tree became entrenched in Ayurvedic literature. Today it still has folkloric following and ethnobotanical studies have thrown up a host of therapeutic uses for its roots, leaves and flowers... Modern pharmacological methods have ratified some of the claims. And so, no wonder, then, that there is commercial exploitation of this tree to produce herbal formulations for reducing gynecological and menstrual problems.

But then, while the investigations have thrown up a host of potential other uses from anticancer to antibacterial, anti-inflammatory, analgesic, anti-helminthic, etc. properties, the separation and identification of the active agents, responsible for each action, are yet to be done. Studies on the differences in the chemical composition of the plant extracts at different times and different geo-bioniches are also scant. This lack of scientific data to assess the quality and effectiveness of the available commercial preparations is indeed of concern. But a more serious concern is the possible over-exploitation of this valuable resource.

A Review Article on **page 1790** of this issue addresses both these issues. It brings together available research to enable undertaking of studies to identify the active agents responsible for different therapeutic uses. It also suggests the route to overcome over-exploitation: a detailed study of the microorganisms associated with the tree. In the past, such studies have proved to be useful not only to save overexploitation of natural resources, but also to cut costs of production, since these microorganisms quite often produce the same active ingredient and can be cultured in labs. Such methods are already being used to produce the anti-cancer drug, taxol, which was previously extracted from the bark of trees. *Taxus brevifolia* was saved from extinction by this method. The Asoka can be conserved if researchers make a concerted effort.

Archeology Weds Astronomy
with Vedic Rituals

A series of archeological excavations from the 60s to the 80s in Mehrgarh, in the Western edge of the Indus Valley, brought to light enough evidence for a continuous settlement from 7000 BC to 500 BC. Mehrgarh is on the route from Iran to Afghanistan to the Indus Valley through the Bolan pass. The findings represented a death blow to the Aryan Invasion Theory built on the meagre evidence of linguistic affiliations between European and Indian languages. The Indus valley civilization was an indigenous development, independent of other ancient civilizations elsewhere and the linguistic affiliations are incidental to prior human migration on the planet as evidenced by recent evidences for a relationship of co-migration of genetic markers and languages.

While waiting for the collaborations among biologists, linguists and archeologists to bring in even more details on human history, T. R. S. Prasanna invites astronomers to consider collaborations with Sanskrit scholars to understand Vedic rituals, for a more accurate dating of the Vedic period. Though *Rg veda*, the earliest text from the times, is primarily hymns to gods, later texts give detailed prescriptions for rituals. Prasanna examines (**page 1882**) Vedic rituals in the light of their relationship to the astronomical positions of the sun and moon as prescribed.

Take for example, Mahasivarathri. The rituals are to be held at the darkest time of the year at the darkest part of the month at the end of the lunar year. This prescription could be followed at the time when it was written. But now, instead of near the winter solstice, Mahasivaratri falls in February – a difference of 68 days – due to the precession of equinoxes. At the rate of 72 years per one day shift, 68 days implies that Mahasivaratri originated around 4900 years ago – sometime in 2900 BC!

Check out **page 1882** of this issue.

Drinking Radiation from Radon

A few centuries ago, when miners in Europe were found to fall prey to a wasting disease, people attributed it to mythical dwarves. By the end of the 19th century, European physicians started attributing the cause to metallic dust particles in mines. Though radon was identified by the early 20th century, it took a few decades to understand that the cause of the high incidence of lung cancer among the miners was the colourless, odourless gas, considered noble because it does not interact with most other elements.

Radioactive radon atoms released from soils that contain radium or uranium, emits alpha rays that can cause mutations and, hence, cancer.

Though Europe, the US, Canada and Australia – involved in mining uranium – were quick to accept this fallout from breathing radon, the problem of radon in groundwater took a few more decades to be recognized.

Radon is a daughter of uranium and Uranium containing soils liberate Radon into groundwater. So the groundwater, in uranium belts, contains more radon. The daughter nucleus of radon is a radioactive form of lead, which also breaks down by emitting alpha rays. So people who drink such groundwater are subject to a longer exposure time than radon that is breathed in. And they may develop cancer of the stomach and colon…

Uranium is found in India too. Jaduguda in Jharkhand is one of the oldest mining areas for uranium. Are people who drink groundwater in Jaduguda exposed to this threat? Read the Research Communication on **page 1855** to find out.

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