

In this issue

Science and Technology

Status of Indian journals

At the end of the first decade of this century, about 50,000 science and technology journals were being published in India. The number has grown rapidly in the second decade. However, the sad fact is that only about 100 appear in the journal citation index of the Web of Science.

In a General Article in this issue, G. Mahesh from the CSIR-National Institute of Science Communication and Policy Research examines the need to improve the quality of Indian journals. Against the backdrop of policies that led to the mushrooming of predatory journals, he stresses the need to scrap many journals and to merge others.

It is not the existence of a large number of journals that promotes good science in a country, he argues, citing the case of Japan. But, if the journals have to improve, they need to publish more papers from foreign authors and get peer reviewed by international experts. Meanwhile, enabling policies that promote a culture of doing good rigorous science will also need to be put in place. Read more from **page 618**.

Carbon Dioxide Fluxes

Oceans and atmosphere

Carbon dioxide is a dissolvable gas. Cooler oceans retain the gas and warmer parts liberate it. Besides temperature, pH and other biological and geological processes control the fluxes of carbon dioxide between the atmosphere and the oceans. On earth, carbon dioxide from volcanic eruptions, fuel burning and the breathing of life forms is redistributed between atmosphere and oceans in a dynamic manner. Adequate consideration of this phenomenon is important while modelling atmospheric carbon dioxide.

In a Review article in this issue, researchers from IIT Guwahati present the theoretical principles involved in

the fluxes and examine the variables and uncertainties in estimating the fluxes using various methodologies available. They then take up case studies of fluxes in major oceans to draw a global estimate of the amount of carbon dioxide that oceans are taking in, every year, at present. Rush to **page 626** for details.

Managing Aquifer Recharge

Reviewing implementation

Rapid lowering of groundwater levels poses challenges to the sustainability of access to water. The response to this challenge led to many strategies, techniques and technologies useful for groundwater recharge. A Review Article in this issue examines the strengths and weaknesses of the diverse solutions, their applications in different parts of India as well as their costs and benefits, to enable knowledge-based decision making about adopting appropriate methods for state, district and individual level action to ensure water availability for the future.

Now turn to **page 641**.

Kinetics and Mechanism

Oxidation of 4-oxo acids

The chemical, 3-benzoyl propionic acid, may look simple – but it is the starting point for many biochemical, pharmacological, cosmetic and other applications. The two functional groups in the molecule – a carbonyl and a carboxy group – are separated by two carbon atoms and are independent of each other. Yet, they are held together by intramolecular forces. When combined with larger molecules, this structure acts as a site for recognition. In other words it is a hapten. So the derivatives of this extraordinary molecule, the 4-oxo acids, are of interest to a wide range of scientists.

Oxidising 4-oxo acids using bromates of potassium or sodium is simpler and more environment-friendly than using metals, points out a Re-

search Article in this issue. The authors take inspiration from the famous Belousov-Zhabotinsky reaction where Cerium(III) is used as catalyst for oxidation involving bromates. They analyse the changes in the kinetics of the reaction under various parameter conditions and the reaction mechanisms involved. Cerium(III), they find, is an efficient catalyst for the purpose.

Read more from **page 651**.

Neglected Rice Landraces

Source for essential nutrients

Thanks to the Green Revolution and high yielding varieties, India now has an excess stockpile of rice. However, in terms of populations with hunger and malnutrition, India still has a position of shame among nations. Hidden hunger, especially due to inadequate polyunsaturated fatty acids is a major concern since they play a major role in the growth and development of children and in the immune and nervous systems. The health and productivity of future citizens is under threat, because of the misplaced emphasis on high yielding varieties instead of varieties that provide better nutrition, points out a Research Article on **page 660** in this issue.

While Europe has taken a firm stand on including essential fatty acids in infant feed, India's rice-eating populations can benefit from understanding which landraces have adequate amounts of omega-3 and omega-6 fatty acids. By examining 98 landraces of rice from different parts of the subcontinent, researchers identify five that can meet the requirements of breastfeeding mothers and children.

Since India can claim self-sufficiency in rice and has become a major exporter of rice, isn't it time the country focuses on the nutrition of its own vulnerable populations?

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