

In this issue

When and why is science right

In a provocative essay (page 673), P. W. Anderson, one of the high priests of condensed matter physics, considers emergence and reductionism. The 20th century has been a triumph for reductionist science, but at times the continuing search for a 'final theory of everything' appears to only underscore the 'arrogance of the particle physicists'. Anderson points out that 'complex consequences can arise from simple causes, especially when you allow the system which you are looking at to be at a different scale from the elementary entities of which it is made'. Here the author encounters 'emergence', a favourite of evolutionary biologists. The author's musings cast in a quasi-philosophical mould should provoke thought and discussion.

Proteoglycans and wound healing

The process of wound healing can leave disfiguring scars on skin. A common observation is that some people are more prone to develop large, visible scars even after relatively minor injury. A class of polysaccharides, proteoglycans, play a critical role in regulating skin functions. On page 697, Pratibha and Gupta review the process of cutaneous wound healing, highlighting the contribution of proteoglycans to the process of scar formation. Under-

standing the mechanisms by which glycosaminoglycans influence processes like collagen fibre formation, cell proliferation, cell migration and cell adhesion may be crucial before rational therapy for skin disorders is developed.

Origin of groundwater arsenic

The toxic effect of arsenic in groundwater, widely used for human consumption has led to a widespread tragedy in West Bengal and Bangladesh. Reports of arsenic contamination of water in other areas have also appeared. Clearly, the geological occurrence of arsenic and its leaching into groundwater assume significance in this context. Arsenic in the geological environment is found in primary sulphide minerals. Madhavan and Subramanian (page 702) examine the possibility that sulphide mining may be a source of arsenic contamination in groundwater sources. Their analysis focuses on the sulphide mining zones of Khetri and Zawar in Rajasthan. Their results suggest that 'arsenic studies should precede mining/smelter operations as a precaution in all sulphide-related mineral resources exploitation'.

Artemisinin as an antimicrobial

The search for new antimicrobial agents is never ending; the ability of

organisms to learn to counter drugs is increasingly raising the stakes on the discovery of new anti-infective agents. Considering that an enormous number of chemical compounds are investigated for their biological activities, it is not surprising to find new uses for old molecules. Artemisinin is a plant product, a sesquiterpene lactone endoperoxide, which has been shown in China to be extremely powerful against the malarial parasite. Recent studies have indeed shown promise for the use of artemisinin and derivatives in treatment of malaria caused by drug-resistant strains of the parasite *Plasmodium falciparum*.

Artemisinin and its derivatives are also active against other parasitic organisms and have been shown to be cytotoxic against cancer cell lines. The wide spectrum of activities of artemisinin is consistent with the chemical fragility of its structure and its consequent reactivity. On page 709 Dhingra *et al.* examine the antimicrobial action of artemisinin and two of its biogenetic precursors, artemisinic acid and arteannuin B, produced by the herb *Artemisia annua*. They report significant antibacterial and antifungal activity in a study where a large number of organisms have been tested. Particularly noteworthy is the antifungal activity observed at low artemisinin concentrations.

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