

In this issue

Electric Mobility

Imagine. It is 2028. You are driving along the highway. Your car is running out of energy. You stop at a local solar farm. Exchange your battery. Pay up and leave. Your car is ready for another 250 kilometres.

This is not an imaginative take-off from this year's auto expo where the media focus was on electric vehicles. It is a future that can be hastened if the Government takes the steps recommended by the General Article in this issue.

On **page 732**, R. Srikanth from the National Institute of Advanced Studies, Bengaluru presents the information needed to provoke action on different fronts: from tweaking policies to aligning plans, programmes and projects to take India into the era of electric mobility.

Inventory of Ants in India

About a century ago, the British managed to create a list of more than 400 different ants in India. The list has now grown to more than 800. But that does not mean that the list is complete. The gap in our knowledge gapes at us. Though it is difficult to enumerate subterranean and arboreal ants, to create a list of ground dwelling ones, there are simple techniques: bait traps, pitfall traps and the Winkler leaf litter extraction technique.

Ants collected by the bait trap depend on the 'bait'. The pitfall trap and Winkler leaf litter extraction are not so constrained. Researchers from the Ashoka Trust for Research in Ecology and the Environment decided to do a comparative study of the two methods to determine the best method for ant enumeration. They set out to use both methods in the Eaglenest Wildlife Sanctuary and the Pakke Tiger Reserve in the western part of Arunachal Pradesh – an area where such enumerations have not been carried out earlier.

In a Research Article on **page 861** in this issue, they describe the techniques they used to determine the best method and come up with suggestions on the optimum sample size to create a comprehensive inventory. The protocol developed is useful for more than just

enumerating ant species. Quantitative data on the spatial variation of the diversity of ants is a key tool to understand the mechanisms limiting and shaping ant communities, say the authors.

Environmentalists can now train school children to volunteer and use this protocol for a citizen scientist programme to complete the task on an all India scale.

Archaeology sans Digging

Any archaeologist will feel a thrill when looking at a large mound in an otherwise flat area. Lurking within the mound could be evidence of habitation in a bygone era. Archaeologists attack such mounds with chisels and brushes to slowly uncover the history of an earlier civilization – spades and crowbars may break the ancient pottery and destroy evidence...

Enter the technology of ground penetrating radars. If you send off electromagnetic radiations of frequencies from 200 to 400 MHz and capture the reflected waves using antennas, you can reconstruct what lies underground. The technique has been used by civil engineers to understand what lies underneath, to estimate the need for foundations. Geologists, too, found the technique useful. Now it is the turn of archaeologists.

To lead the way to the new era in archaeology, engineers from the Indian Institute of Technology Gandhinagar examine an unexcavated area of Dholavira, one of the partially excavated Harappan sites, using ground penetrating radar. Without digging even an inch, they discovered ancient civil works constructed for dealing with water, buried under the soil. In a Research Article on **page 879** they provide the details.

Armed with the right tool and informed by images from underground, archaeologists now need not hesitate to use crowbars and spades, at least where there are no valuable ancient remains.

Masked Emotions Leak

From left lower face

Social situations often demand the masking of emotions. Darwin, during his study of the expression of emotions

in animals and man, realised that the process of acculturation can lead to the suppression of the expression of emotions and that true feelings can yet be perceived by observant others. More than a hundred years later, Paul Ekman brought Darwin's work out from obscurity and investigated the phenomenon with available tools. And within decades, the ideas percolated to the public through a popular TV series, *Lie To Me*.

Now, in a Research Communication in this issue, Ananya Mondal and others from the University of Calcutta bring out yet more details on the leakage of masked emotions. They took two primary emotions – happiness and sadness. A selected sample of young volunteers imagined happy (and sad) situations from their lives. And they suppressed the emotion(s) when an observer entered the room. The researchers documented the changes in expression using a high speed video camera and the frames were analysed using a coding system for facial action. The asymmetry of the face that is masking the emotion was amplified by compositing the left and right side with their mirror images.

The right brain tends to express spontaneous emotions. The left brain calculates the social implications of expressing those emotions. And tries to replace the expression with a false one. The drama of their dominance over the facial muscles plays out on the opposite sides. Read on from **page 901**.

Himalayan Cryosphere Crisis

Karakoram, Chorabari, Patseo, Baspa basin... Are the Himalayan glaciers really retreating? How fast? What are the contributing factors to the development or retreats of the glaciers? What are the current strategies and difficulties in understanding the glaciers without standing on them? We bring you a special section on the gravity of the questions related to Himalayan glaciers. See **pages 759–813**.

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