In this issue

Feline and human conflict

A shepherd leans lazily against a tree. He forces his drooping eyelids open, and steals an anxious glance towards the thick undergrowth of the forest, a few hundred meters in front. His cows, phlegmatic as ever, drift closer and closer to the forest. The tinkle of their bells only makes the silence of the forest more apparent. Hidden in the dense foliage, and as quiet as silence, a feline crouches as she eyes her prey – a naïve calf. The shepherd's heavy eyelids continue to wrestle with his will to stay awake. The feline's pupils constrict pin-holed in anticipation, she readies herself.

From the dense evergreen to the dry deciduous, the fierce leopard is found in many different kinds of forests across the country. These forests ensure that the leopard, and the human – another fierce predator – are kept far from each other. The wild leopard thrives inside forests; the civilized human, outside. Over the last few decades, however, vast swathes of forests have been slaughtered by human hands to make room for agricultural lands to feed their ever rising numbers. This encroachment of the human into leopard territory has resulted in a significant dilution of prey numbers, leaving the leopard little choice but to sneak into human territory and prey on livestock. A bloody conflicts ensues; after all, even the leopard feels hunger.

Indeed, according to recent studies, in several regions of India – particularly where the human invasion is significant – livestock comprises a substantial part of the leopard's diet. In the forests of Maharashtra (or whatever little that remains), for example, about 90% of the Indian leopard's dietary needs are met by consuming livestock meat. It should therefore be most intriguing to note that a Research Article, in this issue of *Current Science*, reports a result in stark contrast.

The study – conducted in the forests of Valpuria plateau, Western Ghats – reveals that although the human, by supplanting hundreds of acres of the forests with coffee and tea plantations, has encroached deep into leopard territory, the rosette cloaked feline feeds predominantly on wild prey, even when a preponderance of easy livestock prey exists. Why is this so? Turn to **page 323** for the answer.

The well sucks hard

RIVER bank filtration is a technology wherein river water is filtered by forcing it through the minute pores of underground soil layers – the great sieve.

First, like one sucking on a giant straw, motor pumps create a powerful suction at the bottom of an open ended well. Baited by this suck of the well's mouth, the water from a nearby river – only few tens of meters away – seeps through the banks, and begins to percolate towards the well by squirming through the pores of the underground. Simultaneously, owing to several biochemical processes taking place in the soil layers, contaminants in the river water – pathogens, for example – are filtered out. The river water, however, is not the only one seduced by the beckon of the well.

Even groundwater, stoic still deep beneath, is summoned by the suction, and, consequently, intermingles with the slow treading caravan of river water. This mixing of water serves two purposes. First, the river water gets diluted by the pure groundwater, and hence filtered further. And second, spurred by the sudden increase in water volume, the river water gains momentum, and gushes up through the well. Indeed, had it not been for the groundwater's kick, the trek of the river water upwards through the well would have been arduously slow, and economically unfeasible: *Imagine how painfully difficult it is to suck but only a single drop of water through a straw*. But often, even after being forced through such an intensive 'sin cleansing' pilgrimage, the filtered river water is still not pure enough for the picky human. How come?

One important reason that explains the impurity of the filtered river water is that the well is too close to the river. Indeed, 'too close' implies fewer sieve holes of the underground that the river water has to squirm through as it moves towards the well. But if the well is too far away then the filtration process, although more scrupulous, would be too slow. So, how far *precisely* from a river must a well be dug to ensure that the water is filtered pure? A Research Article, **page 301**, answers.

Ants milk honey from cows

AN army of hundreds of ants threads upwards through the branches of a Yellow bauhinia as it makes its way towards the target: treehopper babies – known as *nymphs* – no longer than a thumbnail's thickness. As infamous as ants are for their murderous instincts, the intention of these particular ants, *Camponotus compressus*, is not belligerent, however. These ants are milkmaids. Only instead of cows they milk treehoppers, which coincidentally are also known as 'cow-bugs': *Oxyrachis tarandus*.

The ant, like the graceful and delicate suckle of the milkmaid's palmed grasp, first strokes the nymph with its antennae. Coaxed by this gentle stimulation, the nymph secretes – or rather excretes – a succulent drop of translucent honeydew through its posterior end that the ant, given its sweet tooth, ravenously drinks up.

In return for the treat, the grateful ant renders its services to the cow-bug both, as a housemaid, continually cleaning it; and, more importantly, as a fierce body guard. A Research Communication, **page 362**, delves into this *Quid pro quo* mutualistic interaction between ant and nymph, and discovers something quite extraordinary.

According to the study, the foraging activity of the ants, which ostensibly appears to be frenzied and chaotic given their prodigious numbers, is actually governed by a congruent precision. Indeed, it is observed that the same ants keep returning every day to the same cluster of nymph treehoppers thus exhibiting high fidelity to a patch of nymphs. Of course, the reader would shrug his shoulders and say: 'So what?' Ants are after all known to secrete pheromones that other ants could follow to reach the same destination every day. But these ants, unlike most other ant species, do not pave the route between nest and food with chemical 'bread crumbs'.

So, how do they, do it? How can these ants, no different from the dutiful milkmaid, tread the long distance from their nest to the *same* cows day after day? Although the answer to this question is beyond the scope of the study in question, the authors, nonetheless, hint at a plausible answer: *Ant memory*, they whisper in our ears.

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