In this issue

Alternative Teaching Method

Action and reactions in classrooms

The normal practice for imparting education in colleges is to give lectures – the *de facto* method of teaching in tertiary education. But does true learning take place?

Take, for example, the concept of resonance in organic chemistry. Students from the Plus 2 level are exposed to the concept. But even students who take up a chemistry major later, end up not mastering the notions of 'Lewis structures' and 'formal charge', crucial in understanding the reactions and chemical bonds.

A few faculty members in Mumbai got together to break the tradition of lecturing. They experimented with an inquiry oriented learning method where teachers play the role of guides and facilitators and students are broken up into groups to solve problems in a collaborative manner. They adapted the textbook to the new pedagogic strategy where the teacher intervenes only when a group of students encounter a difficulty.

They tested this new method – Process Oriented, Guided Inquiry Learning or POGIL – along with the instructional material in two different colleges in Mumbai.

In a General Article on **page 1152** in this issue, they argue that the results from adapting and adopting the POGIL method were far superior to the traditional method of lecturing. It makes classrooms more active and the teachers are able to identify the conceptual difficulties that the students face.

The group is now experimenting with other topics in the organic chemistry syllabus. College lecturers elsewhere too, need to experiment with this method in other scientific disciplines.

Crabs Climb Trees

Strategy to escape predation

If you go to the Kunhimangalam mangrove forests in Kannur district, Kerala, you will find the mangrove crab, *Parasesarma plicatum*, in plenty: the density of population is more than five of them in a square meter! These forage on decaying organic matter on the forest floor or in shallow waters and can feed under water. But when the tide rises, they climb trees, as if to escape from the waters.

Scientists in Kerala noted that the crabs move away from areas with only grass towards trees during high tide and wondered. Why are they doing this? They noted that these crabs tend to prefer trees that do not get submerged and are strong enough to support their weight.

These crabs are prey to carnivorous crabs, reptiles, birds and mammals. The area is known to have many predatory fish as well. Are they trying to escape from fish? The scientists took the crabs to the labs to check and recreated artificial high tide, with and without trees. And tested the system where crabs are well fed and hungry. The hungry crabs went down the water to eat, whether trees are there or not. So evidently, they are not escaping from water. Now scientists introduced a predatory fish into the system. Presto, the crabs were back on the trees.

Like Charles Darwin who concluded that earth worms are intelligent after his investigations, in a Research Article on **page 1201** in this issue, the scientists admit that these crabs are intelligent enough to choose strategies for escaping from predators.

Gas field leakage puzzle in Assam

Sometimes cheaper geophysics work

Upper reach of the Brahmaputra valley in Assam has multi-layered richness. Tea gardens on the surface, coal in the shallow subsurface and oil and gas in the deep subsurface. Leakage from the deeper layers of gas fields is very rare. Moreover, if gas enters into a number of shallow aquifers, the problem becomes too complex to handle. However, scientists in the Dibrugarh University, say that simple and cost effective strategies can be taken up not only to understand the problem better but cheaper supply to the poor villagers can be ensured by micro-level gas-pipe networking.

There is plenty of oil and natural gas underground in parts of Assam. Attempts to tap oil started 150 years back. To control blow out in one of the gas fields near Duliajan, a prominent OIL township, a well was 'killed' in 2011. This surgical measure was thought to tackle bigger disasters. However, after this event the villagers in the surrounding area started reporting gas leakage from different places.

In a Research Communication in **page 1242** in this issue, scientists examine the 'controls' on the basin and probable mode of gas spread in different horizons. They examined the available data and conducted different types of cheaper electrical surveys as a pilot project. Based on these they put forth a concept model to explain gas leakage from the ground.

Scientists are aware that providing an explanation is not enough. If careful monitoring is not undertaken, other gas explosions cannot be ruled out. Action is needed to use the valuable natural resource that is being wasted.

Secretariat building in Chandigarh

Selecting the sealants and protectants

The secretariat building in Chandigarh was built about 70 years ago. But now, instead of looking like a heritage building for the planned city, it has started looking shabby. Environmental weathering is taking its toll on the building that has weathered several political storms. What can one do?

Chandigarh has extremes of weather, it is blessed with monsoon and, therefore, humidity also goes through a seasonal yo yo. How can one protect the building from weathering?

In a Research Communication in this issue, scientists from the CSIR-Central Building Research Institute, Roorkee, examine the possible solutions and compare the relative efficiency under different conditions.

Many house owners in the region can get some free advice on protecting their houses from weathering. Just turn to **page 1234** in this issue.

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