Dissolving rocks

Limestone rock dissolves in rainwater. It causes spectacular caves, hard water and 'furred-up' kettles.

Limestone and chalk rock are natural substances that dissolve in rainwater. Over millions of years, water dissolves the rock and this causes caves to form. However, the limestone is easily made to come out of the water, and when this happens it makes rock again (Picture 1).

Hard water

Where limestone is dissolved in streams and tap water, the water is called **HARD WATER**.

You can easily tell if you have hard tap water. Go to a tap and try making a lather with soap and water (Picture 2). If your hands stay scummy and you can't get much of a lather, you live in an area with limestone dissolved in the water.

▲ **(Picture 2) Hard water will not form lather with soap, and forms a scum instead.**

▲ **(Picture 1) The needle-like columns that hang from the roofs (stalactites), or grow from the floors (stalagmites), of caves are places where water containing dissolved limestone drips from the roof of the cave and splashes on the floor. When the water evaporates, the limestone remains. In both places, the limestone has come out of solution and formed rock.**

'Fur' in kettles

Another way to check for hard water is to look inside a kettle. If you see a white coating on the heating element – called 'fur' (Picture 3) – you have a coating of limestone rock inside your kettle!

Getting the limestone out of water

Limestone dissolves in cold water. But limestone is, unusually, less soluble in hot water. So when the limestone is heated,

it comes out of solution. This is why the element in a kettle 'furs' up.

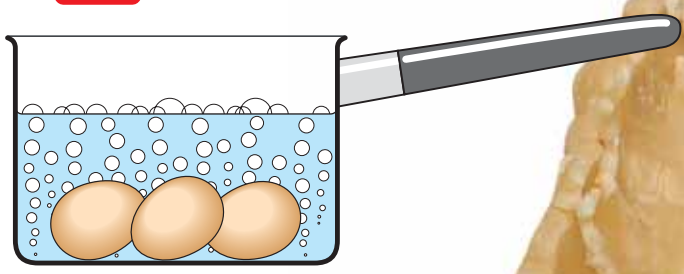
Boiling some eggs in cold water in a clean, non-stick (Teflon or glass) saucepan (Picture 4) shows how the limestone in eggshells comes out of solution as it heats up. Once the eggs have boiled for a while, take them out and pour the water away safely. Let the pan cool, then look inside. The limestone makes a white film on the surface.

It is possible to remove dissolved limestone from water. The device that does this is called a water softener. Some people in hard water areas have water softeners installed in their homes.

Summary

- **Hard water contains dissolved limestone.**
- **Heating makes limestone come out of solution.**
- **Limestone will cause 'fur' on kettles.**

SAFETY Never go near boiling water. Always get an adult to help.



▲ **(Picture 4) Boil some eggs in water in a non-stick pan for several minutes (as though you were hard-boiling the eggs) and then pour the water away. Let it cool down completely and you will be able to see a white limestone film on the non-stick surface. It will wipe off onto your finger.**

▼ **(Picture 3) The 'fur' on a heating element is limestone that has come out of solution and made rock.**