Mad as a hatter

You have probably used the phrase ‘mad as a hatter’ and you will also have heard of the mad hatter, a character in *Alice in Wonderland* by Lewis Carroll.

The origin of the term is in fact an example of an early industrial occupational disease that affected hatters – people who made felt hats. Felt hats were once very popular - an example is the top hat. The best hats were made from beaver fur, but cheaper ones used furs such as rabbit instead.

Felt is a fabric that is made by using steam and pressure to make fibres mat together without the need for spinning and knitting or weaving. Some fibres, such as beaver fur, mat together easily, but cheaper furs need chemical treatment to roughen up the fibres so that they will stick together. In the 1800s, one of these processes was brushing a solution of a mercury compound - usually mercurous nitrate (mercury(I) nitrate - on to the fur. Hatters working in poorly-ventilated workshops would breathe in the mercury compounds. Mercury accumulates in the body, that is it is not excreted, so that levels of mercury build up over time

We now know that mercury is a cumulative poison that causes kidney and brain damage. Physical symptoms include trembling (known at the time as *hatter’s shakes*), loosening of teeth, loss of co-ordination, and slurred speech; mental ones include irritability, loss of memory, depression, anxiety, and other personality changes – hence the victims being thought to be mad. This was called mad hatter syndrome.

It’s been a very long time since mercury was used in making hats, and now all that remains is the phrase. However, doctors still refer to mad hatter syndrome as a description of the symptoms of mercury poisoning.

We are still exposed to mercury in the environment, for example in batteries, tooth fillings, fluorescent lamps, necklaces and other jewellery, paint and thermometers.

There is a debate about the safety of mercury in tooth fillings but is it generally acknowledged that it is safer to leave them in place than to remove them because the drilling required to do this would have the effect of spreading the mercury.

School laboratories may have low levels of mercury vapour in the air resulting from broken thermometers, which is why your teacher will insist on any breakages being carefully cleaned up. This is not a risk to students who spend only one or two lessons a week in a lab over five years or so. It might just be a cause for concern for teachers, who spend their whole working week in a lab over a career of up to forty years. You may think that this could explain the some of the quirks of your chemistry teacher! However, laboratories are checked for mercury levels in the air and, in the last five years, only one school has shown any cause for concern.