Most of us know how gas detection works today – particularly in the mining industry, but do we understand how it has evolved over time? CLAIRE RENCKEN investigates.

To understand just how far we've come in gas detection, we need to know its history. When gas detection was first needed, the light bulb hadn't yet been invented. With the beginning of the Industrial Revolution, fuel became very important.

Coal had to be mined from the ground, which required extensive manual labour. Methane is especially dangerous, because it cannot be seen. It has no smell and appears naturally from the ground. When miners began to realise how dangerous methane was, they began exploring ways to detect it.

The first method involved using humans – back then the feeling was that it was better to lose one man than to lose an entire group of workers. The miner wore a wet blanket over his shoulders and head, and carried a long wick with its end lit on fire.

He entered the mine and began to move the flame of the wick along the walls of the mine. When he hit a small pocket of methane gas, it would ignite, but the miner remained fairly safe under the dampened blanket. Sometimes he would hit a huge pocket of methane, which would ignite the entire area around him.

The next method of detection was to take a canary into the mine. Canaries were used because they have an extremely loud chirp. Additionally, the canary bears the closest resemblance to the part of our nervous system that controls breathing.

A miner would carry the bird in its cage into the mine. It was said that when a canary was about to die, it would start to shake the cage. Then the miners knew to exit the mine. If the canary wasn't making any noise, they knew to make an even more urgent exit, as the canary had died!

Later, a flame light was used. The flame was encapsulated in a flame-arrestor shell so that it could not ignite the outside atmosphere. On the outside of the flame light was a glass piece that had three incisions running horizontally along the glass.

The miner always started the flame in the middle line, while in a fresh air environment. If he noticed that the flame was lowering down to the bottom line and starting to go out, he knew he was in an oxygen-deficient environment.

If miners noticed the flame rising to the top line, they knew the atmosphere was either beginning to have methane current or they were in an oxygen-enriched environment. However, the flame light still posed a threat to miners. If it was accidentally dropped, and the glass broke while the flame was lit, it could ignite the atmosphere if methane was present.

The first gas monitor was a device with a valve that analytically showed how much methane was present in the atmosphere. The methane was detected through a sensor called the catalytic diffusion sensor.

Today, gas detectors have batteries, which enable the instrument to run for long periods of time without having to be turned off. Also, modern-day monitors not only measure oxygen and methane, but can measure several different gases simultaneously.

Thankfully, we’ve come a long way since unsuspecting birds were taken down mines.