



### **World War I Canaries**

One of the tactics used in WWI was to tunnel under no man's land and under the enemy trenches. The tunnels were then filled with explosives and detonated just before an attack. One of the major risks in mining is suffocating from carbon dioxide or methane. Caged canaries carried into the tunnels would sing their hearts out while the men worked, but if any gas started filling up the mine, they fell silent (Canaries are very susceptible to lack of oxygen and so give the miners early warning of gas infiltration into the tunnel, giving them time to escape). They saved many miners lives throughout the world, and did so on the battlefields of WWI. There is a memorial to Canaries and White Mice entitled "The Tunnellers Friends" in the Scottish National War Memorial in Edinburgh Castle.

Canaries, and birds in general, are suited to this not just because they're small and portable, but because their anatomy makes them vulnerable to airborne poisons. Birds are continuously "inhaling." This is what helps them fly, which is already a tremendously taxing aerobic activity, at heights that would cause a human altitude sickness. Human lungs house many little alveoli - sacs with thin outer layers that allow oxygen to pass into the bloodstream while letting carbon dioxide out of the blood stream and back into the lungs.

For birds, the oxygen goes in and the carbon dioxide out, when it travels through a structure that resembles a ribcage-like series of tubes. When a bird draws breath, it passes air through those tubes, absorbing the oxygen into its bloodstream while the remaining de-oxygenated air goes into two sacs in its body. It also takes in air that rushes directly to a second set of sacs. When the bird exhales, the "spent" air rushes out, along with the carbon dioxide. That second set of sacs, full of unused air, also empties. Their oxygen-rich air rushes through the tubes on its way out, letting the blood absorb yet more oxygen. Birds are getting fresh air when they inhale and when they exhale - a double dose for our single one.

This makes birds great at taking in oxygen, but extraordinarily sensitive to poisons in the air. A canary is taking in the poison twice with every breath.

Article provided by Nigel Allsopp