

If someday you hitch a ride with a strange pilot and notice a bird cage built into his panel, don't hit the silk! He may be out of date, but he is not necessarily cuckoo. That canary is an excellent carbon monoxide detector and one which had little competition from instrument manufacturers before 1930.

Carbon monoxide (CO) is a colorless, odorless, tasteless and very poisonous gas that is generated in copious quantities by most internal combustion engines. Occasionally, it finds its way into the cabin of a flying airplane, usually through a defective heater.

While somewhat of a backslider now, I have been a chemist and engineer for nearly 30 years and have dealt with a great many poisonous materials, including some chemical warfare specialties. Of all of them, carbon monoxide is the most insidious.

Cyanide gas has a characteristic odor. Strychnine is bitter and arsenic has a metallic taste. But carbon monoxide sneaks up on its victim without any warning, whatever. Eventually, it may cause headache and nausea; but the appearance of these symptoms can come too late for an unsuspecting pilot, because his judgment will have already been impaired. By that time, he is apt to misinterpret them as due to eyestrain, fatigue or "something he ate." Carbon monoxide may have been the real culprit in many of our "pilot error" accidents.

Prolonged exposure to an atmosphere containing any more than 100 parts (.01%) by volume of carbon monoxide per million is generally considered unsafe. A concentration

of .02% may impair judgment and cause headache during a four-hour flight. In a couple of hours, .06% can produce unconsciousness, while 0.1% over a similar period may result in death. Higher concentrations can cause unconsciousness after a few breaths and death within a few minutes.

All pilots should be on guard for the danger signals, especially during cold weather, weak and indefinite though they may be: physical lassitude; headache; nausea.

Immediately on recognizing any one or more of these symptoms you should do the following:

1. Cut off your heater.
2. Vent lots of fresh air (however cold) into your cabin.
3. Descend to as low an altitude as safe flying permits.
4. Land as soon as possible.
5. Have a good mechanic inspect your engine exhaust manifold, your cabin heater and every other possible source of exhaust-gas leakage.

This advice may cause a few unnecessary landings, but it also can save lives. For the man who would not waste time guessing, investment in a lightweight carbon monoxide tester is suggested. For example, Colorimetric model BY-47133 is available from the Mine Safety Appliance Company, Pittsburgh 8, Pa. Anyone capable of reading his tachometer can operate this simple instrument, which weighs less than a pound and comes in a convenient leather case with a dozen extra indicator tubes.

The replaceable indicator tube was developed by the National Bureau of Standards and was used exclusively



Yellow silica gel in Colorimetric tester turns green when air it samples contains carbon monoxide

by the Armed Forces during World War II. The tube contains a yellow silica gel impregnated with a complex silico-molybdate compound and catalyzed by means of palladium sulfate. In use in the M.S.A. tester, the sealed ends of a detector tube are broken and the tube inserted in the tester's tube-holder. When an air sample contains carbon monoxide, the yellow silica gel turns to a shade of green, the intensity of which is directly proportional to the concentration of carbon monoxide in the air. A color scale helps determine the percentage of pollution.

Blood is just contrary enough to prefer CO to oxygen. Once it ties up some of this treacherous stuff, your hemoglobin will try to hang on to it. So, if ever you are unfortunate enough to get a good dose of carbon monoxide and are yet fortunate enough to survive, you'll have a swell hangover. Oxygen helps and so does a physician. But you may still have a headache for two or three days. Don't try to fly until you are entirely over it.

END

You Can't SEE Carbon Monoxide

Pilots should be alert for signs of the insidious cockpit poison—it's a quiet killer

by HENRY MESSMAN • AOPA 38004