Danger in a Cave

How can a cave serve as an introduction to air pollution problems? Consider this modern-day example.

Wednesday, April 28, 2004
St. Paul, Minnesota

It was televised on the national news that day - what was just another adventure for five high school students became deadly. Three teenagers died while exploring a cave along the banks of the Mississippi River near St. Paul, Minnesota. One boy was able to get out of the cave to call for help, but it was too late for three of his friends. His fourth friend survived after being rescued.

The cave was in a large network of caves with so many entrances that it would be hard to close all entrances to the caves. There were signs warning people to stay out of the caves since two other teens died there in 1992.

Unlike natural caves in parts of the United States, many of these man-made "caves" were left by sandstone miners in the 1800s. At one time, the caves were used to grow mushrooms, make and store cheese, and store bricks. There was even a nightclub in one of these caves in the 1930s.

What went wrong with the cave exploration? Something in the cave was lethal. As for natural sources, bad air in caves can result from build-up of gases from decomposing vegetation and bat guano. Could the problem be methane? Carbon dioxide? Ammonia? Officials speculated that the culprit was carbon monoxide.

How did the pollution happen? St. Paul officials believe that fires in the caves started by previous visitors could have produced the carbon monoxide. Poor ventilation probably contributed to incomplete combustion and the production of carbon monoxide instead of carbon dioxide.

Closing all of the entrances to the caves is not feasible. Warning signs do not seem to work. What can be done to prevent another tragedy?

Update as of February 2005
The city of St. Paul is working on a plan to address the problem using barricades. A cave where there is a bat sanctuary will not be sealed due to concerns of naturalists. A protective gate is already in place at the bat cave.

Thought Questions

We no longer live in caves, but are our homes and buildings at risk for air pollution? Although not enclosed like a cave, what are the similarities between what is happening in the Earth's atmosphere and what happened in the cave story?

Source*:* Cable News Network. (2004, April 28). *Three Teens Die of Carbon Monoxide Poisoning in Minnesota Cave.* Retrieved August 22, 2004, from http://www.cnn.com/2004/US/Midwest/04/28/cave.deaths/.