Thinking About Hidden or Non-obvious Causes

Air, and therefore air pressure, exists all around us. Air pressure and changes in air pressure cause many things to happen. Most of these things we don't notice because:

- There may be no changes to notice. Air pressure often causes things to be the way that they are. If all of the air pressure suddenly disappeared, you WOULD notice it.
- Changes in air pressure are usually small enough that we don't notice them until something surprising happens, like our ears suddenly popping when we drive up a mountain or fly in an airplane. Even then, we usually look first for causes that we can see or that have to do with our ears, not causes that we can't see.

Finding Hidden or Non-obvious Causes

Most people look for obvious causes first when something happens. For example:

> A mother with a baby is in a plane. Before and during take off, the baby is happy. About 10 minutes into the flight, the baby becomes increasingly fussy and then starts to cry. The mother wonders why he is crying and looks to see if his diaper is wet, if he is hungry, and then as he cries in pain, whether a zipper is pinching his skin. Then as her own ears start to hurt, she begins to consider other, hidden causes of the baby's crying. Because her ears hurt AND the baby is crying, she can figure out that it probably isn't something just in her ears. The mother reasons that her baby's ears hurt as well, which would then lead her to look for a non-obvious cause that affects both of them, and that would necessarily lie outside of them. Otherwise, she would probably check her ears before thinking about what is around them that she can't see.

Notice how the mother first looks for obvious causes and local causes. Obvious means "right in front of" or "easily discovered or understood." Local, in this case, means "closest to the effect." So if the pain were in her ear, she would usually check there first instead of checking for changes in her environment.

Analyzing Hidden or Non-obvious Causes

When scientists think about possible causes, they consider obvious and non-obvious possibilities. When you are trying to determine the cause of an event:

1. Ask yourself: What are some possible causes? List these out on a piece of paper.
2. Now look at your list. Which ones are local (closest to the effect)? Do you have any that are non-local (far from the effect)? If not, try to think of some.
3. Which ones are obvious (right in front of you or easily discovered/understood)? Do you have any that are non-obvious (not right in front of you or not easily discovered/understood)? If not, try to think of some possible non-obvious causes.
4. Are there other possibilities that you can think of? If so, add them. If not, go over your list again and think deeply about which cause best fits the evidence.

Considering obvious and non-obvious possibilities can help you create better explanations in science.