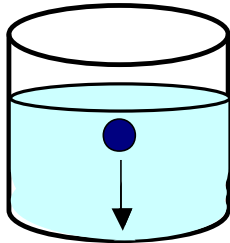# Relational Causality and Layering Liquids

We often analyze problems by using <u>Linear Causality</u>. We say that one thing made another thing happen. For example, we might say "the density of the object made it sink."
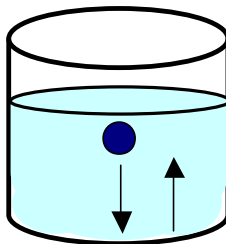
Linear Causal Explanation

However, scientists don't usually think about cause and effect in such a simple way. When they analyze cause and effect to consider the role of density in sinking and floating, they think about it in terms of relationships. They use a <u>Relational Causality</u>. For example:

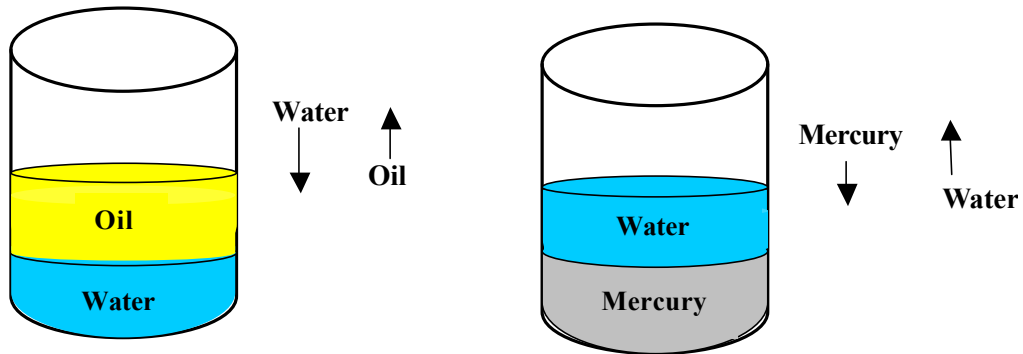**Relational Causal Explanation**

Whether something sinks or floats based on its density actually has to do with a relationship. The "cause" isn't a thing or an attribute (how dense, how heavy, how big, etc.). The cause is a relationship—the relationship between two or more densities.

So scientists would say, for instance:

- ➢ "if one liquid or gas is denser than another, the denser one sinks and the less dense one floats on the denser one."

- ➢ "if an object is denser than the liquid that it is in, it will sink."

So something (gas, solid, liquid) doesn't just sink or float by itself, it can only sink or float in a relationship with another thing (gas or liquid). You can make

comparisons, but they only make sense in terms of the relationship. For example, in the relationship between water and oil, water sinks and oil floats. However, in the relationship between mercury and water, water floats and mercury sinks.

Sinking and floating, based on density, is best described by a relational causality:

➢ The outcome is caused be the relationship between elements of the system.

➢ Neither "element" is the cause by itself.

If you focus on only one of the elements that contribute to the outcome, you lose important parts of the story.