Specialized Meaning of Words

by Dr. Tom Sheahen

Q. On TV I saw that the ice in Antarctica is collapsing, and that will raise sea level and inundate cities. Others reports say this will take thousands of years. How serious is the problem?

What you are witnessing here is a result of confusion between the public perception of the ordinary meaning of words, and the very special definitions used in scientific discourse.

Geologists deal with changes in the earth that occur over epochs of millions of years. Anything that happens in less than 10,000 years is "sudden," and something happening in only 1,000 years is "instantaneous." To geologists, the word "collapse" is appropriate for a 10,000 year process.

A hot-topic in the media these days has to do with the *West Antarctic Ice Shelf* (WAIS), a region comprising about 8% of the ice covering Antarctica. Within that region, there are two glaciers that are sliding down to the sea at a steady pace, as glaciers always do. They comprise about 10% of the WAIS, less than 1% of Antarctic ice. This descent has been in progress for several thousand years, and is neither new nor man-caused. It will go on for a few thousand more, after which they'll be gone. In the parlance of geology, those two glaciers are *collapsing*.

If that doesn't sound to you like your usual meaning of the word "collapse," you're absolutely right. It's a specialized geological term.

Unfortunately, the major media overlook the distinction of meanings, and then make the further generalization from two specific glaciers to the entire WAIS, and moreover to Antarctica in general. Scientists who point out the small actual glacier size (and volume of ice) are brushed aside in the rush to get a headline or a flamboyant sound byte that will keep the viewers tuned in. Words like *unavoidable collapse* carry a sense of foreboding.

This isn't just a problem from geology. Confusion over the meaning of words used in science crops up frequently. Laws of physics (e.g., conservation of energy) are said to be true *in general*, meaning "always true." But if a physicist says "that is generally true," a non-scientist hears "that is *usually* true" – meaning "most of the time, but not always." Neither is aware of the other's interpretation.

The word "average" is easily misunderstood. For any set of data, about any topic, you can construct an average. But it may be irrelevant – a good example being the "average temperature of the Earth." Regional and seasonal variations are so great that a single average number is meaningless. And yet people have such familiarity with the word "average" – batting averages, school grade averages, etc. -- that it's commonplace to believe that any statistic called an "average" represents something real.

Climate change is another prime example. In the ordinary sense of the term, everyone realizes that the climate changes, and there is no argument about it. However, there is a very

special limited definition given to the term by the U.N. around 1990: “Climate Change” refers *only* to changes caused by mankind’s emissions of CO_2. Under that restricted definition, anyone who doesn’t think that CO_2 is the cause of the changes we’re experiencing is labeled a “denier” of Climate Change. The frequently-recited figure of “97% consensus” is too small for the percentage of scientists who recognize climate change in the ordinary sense of the term; it’s much closer to 100%. But in the specialized U.N. sense (about CO_2 driving the change), there is widespread disagreement based on reliable opposing scientific data.

In the absence of quotation marks, italics or capitals, ordinary citizens have no idea that the controversy is rooted in radically different meanings of the same words.

Elected officials striving to be responsive to their constituents’ concerns are often pressured by advocacy groups who have latched onto an incorrect interpretation of words. Scientists are sometimes guilty of riding a bandwagon that formed when the public misunderstood and exaggerated their original meaning; perhaps it’s convenient, prestigious and financially advantageous to let that confusion continue uncorrected. The effect snowballs and leads to new laws being passed, with expensive new regulations. Years later, with nothing accomplished, people ask “Oh, is *that* what you really meant?” Then the blame game begins, after much taxpayer money went down the drain unnecessarily.

Even words like “increase” and “decrease” get distorted. When a budget (national, state or local) goes up, you might think that’s an increase. But if the amount is less than the rate of inflation, those wanting the money call it a decrease, a budget cut. The problem is particularly troublesome at election time, when politicians hurl accusations at their opponents. Without precise definitions, clarity is very elusive.

Unfortunately, attending to precise definitions takes time and seems boring. The media don’t want to run the risk of being boring, and so they take shortcuts and oversimplify. Consequently, a lot of people are misled by statements that use scientific words incorrectly.