A LINE ON LIFE

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Hot and Cold

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I don't think I need to tell you that it is *hot* in Yuma now. However, it might help, if you understand how your body deals with extreme temperatures.

When you get hot, you sweat, but **sweating** does not cool you. The cooling process takes place only when the sweat evaporates. In addition, the **capillaries dilate** (very small blood vessels open) in the surface of the skin. More blood is pumped to the skin's surface, allowing body heat to be lost to the surrounding air.

Knowing this, people would want to minimize the clothing they wear, so more sweat would evaporate, and more heat would be lost. This is fine, as long as you have an adequate supply of **water**. However, without adequate water, you would dehydrate rather quickly and die. Too often this is the fate of illegal immigrants who try to cross the desert to get into the United States. As they get hot, they gradually take off more clothes. Even though this means they will feel cooler in short run, they will lose their body fluids much faster. This leads to increased dehydration and finally death.

On the other hand, our body has different mechanisms to deal with extreme cold. The surface **capillaries constrict** to push blood deeper into the body. This reduces the amount of heat lost to the environment.

In addition, the body's activity increases to produce more heat internally. We call this "***shivering***." Sometimes, we voluntarily do this when we are cold. When we are cold, we increase our activity by jumping up and down, jogging in place or rubbing our body. Of course, putting on more or heavier clothing also preserves our warmth.

Some people believe that having an alcoholic drink will warm you. It can make you feel warmer, but it makes it easier to lose your body heat. One effect of alcohol is to make the skin capillaries dilate. This brings more blood to the skin. Since the heat receptors are close to the surface of the skin, you will *feel* warmer. However, at the same time, you will lose body heat more quickly. (With enough alcohol, you will be more likely to freeze, but less likely to care whether you do or not.)

This warming effect of alcohol is also seen at normal temperatures. Have you ever noticed how you feel warmer after having had a few drinks? Some women don't like to drink alcoholic beverages, because they appear to be flushed or blushing. (The capillaries in their faces are dilating.)

Both wind and humidity modify the impact of temperature.

Outside of temperature, our perception of hot and cold is influenced by two other external factors. One is wind and the other is humidity.

I used to live in Milwaukee, Wisconsin, where mid-summer days were 95 degrees with 95% humidity or greater. At night, the temperature would only drop a few degrees. With the high humidity, sweat did not evaporate to cool you. Your clothes or bed became soaked with sweat. It was terrible! When my family heard we were going to Yuma, Arizona, where summer days could be 115-120 degrees, they thought we were going to roast here.

However, as the saying goes, "*It's a dry heat*." For most of the summer, the **humidity** is less than 10% when we get our peak temperatures. This means that your sweat evaporates quickly, doing a more effective job of cooling you. Even though it's hot in Yuma, you rarely see shirts with sweat-soaked armpits. The sweat evaporates too fast.

There is a second bonus with the low humidity. Instead of dropping only a few degrees at night, temperatures can vary between 30-40 degrees between night and day. A 115-degree day can drop to 80-85 degrees at night. In Yuma, that is comfortable, especially if there is a breeze.

That brings us to the second factor — **wind**. Wind makes the sweat evaporate even more quickly. At the other end of the temperature continuum, I'm sure you have heard of the "*wind chill factor*." That makes cold temperatures seem even colder.

I used to ride a motorcycle. On one summer day — at 120 degrees — I had to drive it to El Centro and back. Assuming I traveled at the speed limit, at 65 miles per hour, there was a nice breeze. The humidity was less than 10%. Even though I wouldn't say I was comfortable, with the high wind and low humidity, I could tolerate the heat. (I don't think I would have fared as well doing a similar drive in the Milwaukee area.) However, in El Centro I drank a half-gallon of water. I quenched my thirst the same way, when I got back to Yuma.

Have you ever heard of anyone shivering at 104 degrees? We used to bring our children out to the AWC pool in the summer. One day we were there when it was 104 degrees with 8% humidity and a brisk breeze. Our youngest son, about 4 years old at the time, got out of the pool. With the breeze and low humidity, the water on his body evaporated so fast, he was shivering at 104 degrees! It is hard to imagine someone could be so cold, when the temperature is so hot.

Unfortunately, the humidity gets relatively high in Yuma during August and much of September. It is no longer a "*dry heat*." But if we suffer through the Yuma summers, it heightens our appreciation for the Yuma winters.
