Claims:

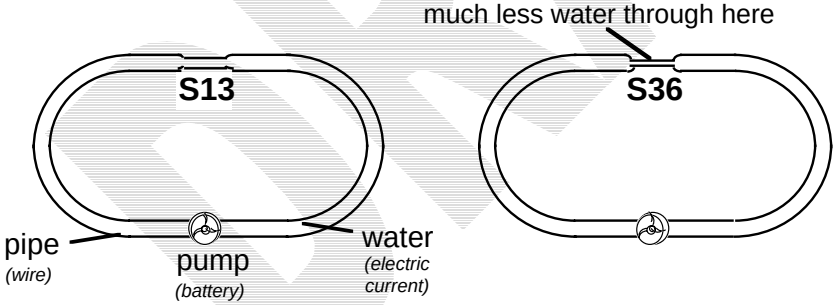
¥ A circuit that has a bulb with a thicker filament has more current than a circuit that has a bulb with a thinner filament.

¥ The amount of current does not change after passing through the bulb.

It makes sense to me that there is more current in a light bulb with a thicker filament. But I was surprised that the current is the same throughout the circuit. That means that the bulb affects current in the whole circuit!

I discussed my results with Kiko and told her about my log analogy. She said physicists sometimes think about water as an analogy for electricity. One use of this analogy is called the water pipe model (see Figure 4). In this model, water flowing through pipes is like current flowing through wires. There s a pump to move the water, which is like the battery causing current. Some sections of the pipe are much thinner than the rest. This is like the filament of a light bulb being much thinner than the wires connecting the bulb to the battery. Less water flows through thinner pipes, just like when my data showed less current in a circuit with a bulb containing a thinner filament.

Figure 4. The water pipe model.



Kiko and I talked about how this model could accurately predict current differences in circuits with bulbs having filaments of different thickness. But what about brightness? I asked. In my log model, I used the fire to think about brightness as well as current, even though that was difficult. But I don t see how to think about brightness at all with the water pipe model. Kiko agreed. We talked about the limitation of models, and how it is often useful to have more than one model to think with. Then she told me about a different model that she uses to think about electric circuits: the water wheel model.