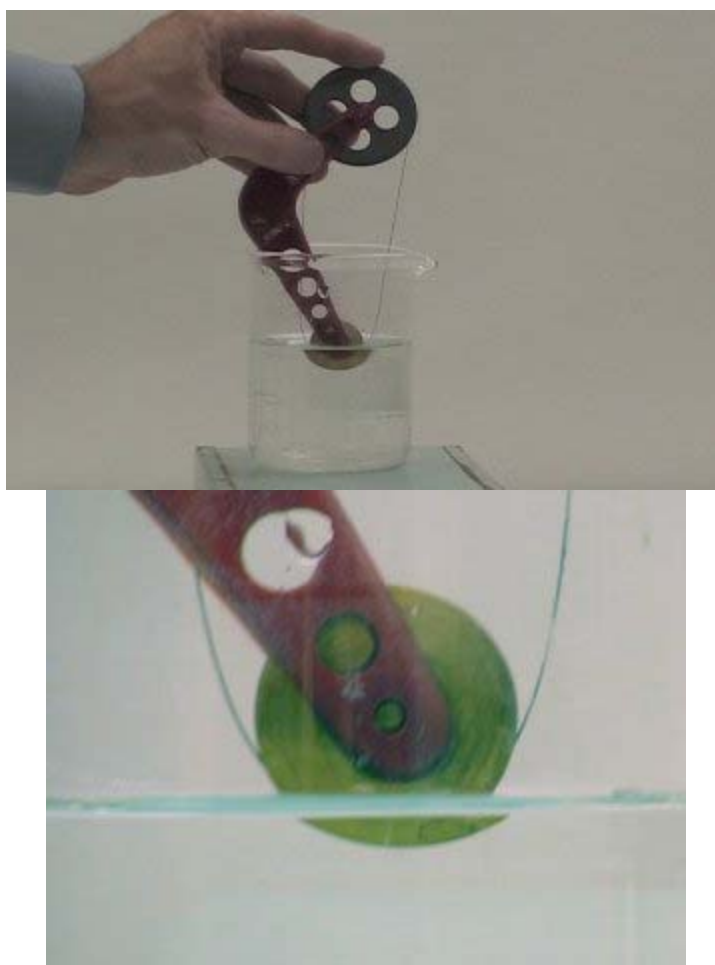


## Question #318

The photograph below shows an interesting thermodynamical device called a "thermobile." It has a large pulley on top and a smaller pulley at the bottom, with a wire wrapped loosely around the pulleys. The wire is "memory wire" made of a material called NITINOL.



Suppose that we partially immerse the smaller pulley into a warm water bath, as seen in the photograph below. Note that Dan is holding the upper pulley so that it cannot rotate even if it wants to. A close-up of the brass wheel in the water is shown at right, below.



**Part 1:** What will happen when the thermobile lower pulley is immersed in the warm water as shown in the photograph but is free to rotate?

- (a) The wire will begin to rotate clockwise.
- (b) The wire will begin to rotate counterclockwise.
- (c) The wire will remain at rest.

**Part 2:** If you believe that the wire will remain at rest, what action would you need to take to start it in motion?

- (a) Start the wire moving clockwise.
- (b) Start the wire moving counterclockwise.
- (c) Start the wire moving either direction.
- (d) Neither direction will work until the wire heats for several minutes.

Click here for [Answer #318](#) after May 19, 2008.

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For questions and comments regarding the *Question of the Week* contact [Dr. Richard E. Berg](#) by e-mail or using phone number or regular mail address given on the [Lecture-Demonstration Home Page](#).