

**Instruments:**

- a hard-boiled egg
- a candle
- drinking glass
- water
- wire

**Experiment:**

- Tie the egg with a piece of wire and hold it in the candle flame. The egg will develop a coating of soot.
- Place the egg in a glass full of water, observe, then remove the egg again.

**Observations:**

Part of the egg shines silver in the glass. Removing the egg again shows that it is still entirely covered in soot.

**Results:**

The silver shine of the egg arises, because air molecules are held tight by the soot. This means that light passing through the glass has to pass through a water-air phase border. Wherever the light exceeds the angle of exclusion (for water  $48,6^\circ$ ) at the water-air interface, changing from an optically more dense to a less dense medium, a total reflection of all light occurs. However, not every beam of light exceeds this angle due to the position of the viewer. This is why only part of the egg seems to turn silver.