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Film 4200 (Jean Hertzberg)
Team Assignment 2 Report
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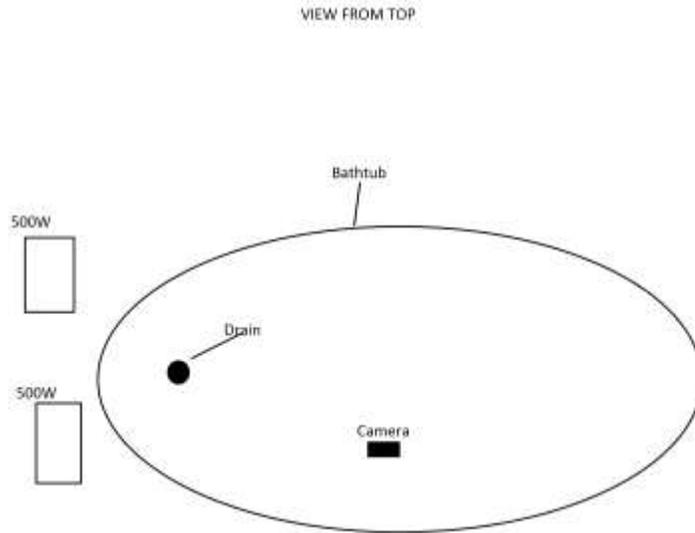
For this second group project my team set out to capture the physics of moving water by using dye to highlight the water's path. Originally the flume was to be the primary tool for this experiment. However, the flume was unavailable to some members of my team for various reasons. Unfortunately, I was one of those who missed out on the opportunity to use the flume and therefore decided to use another device that would still allow for the tracking of water's movement with food dye.

For this experiment a bathtub was filled with approximately 20 gallons of water. I strove to avoid the production of any water vapor and therefore decided to use tepid water. As the vantage point for documentation would be a position directly above the tub of water, the avoidance of water vapor was especially important. The water was allowed to flow freely from the bathtub into the drain when the plug was pulled. The drain was 2" in diameter. The food dye highlights the flow of water just above the boundary layer. A laminar flow is what can be observed in the image. For such conditions, one will find that the flow of water is more laminar near the surface of the tub. The free stream is closer to the surface of the water and it is here that a more turbulent flow can be observed.

A blue food dye purchased at a local Safeway Food and Drug was added in a generous supply to the water in the tub. The dye was then allowed to settle at the bottom of the tub. The food dye required approximately 1 minute to collect at the bottom of the tub. The camera was then set in its position over the tub and the drain was pulled. Two 500 watt halogen bulbs were used to light the set of the experiment. The lights were placed above the tub near the camera. One will notice through careful observation of the image that the lights are not visible as a reflection in the photograph. The lights were not placed in the same position as the camera in order to avoid this very reflection. The built-in flash was also used in the lighting of the set. However, the effect of the flash was minimal as compared to the halogen bulbs.

This photograph was shot with a Sony DSC-H3 with an ISO of 125 and an exposure time of 1/40 seconds. The aperture was set at f/3.5 with a focal length of 6mm. The photo was taken from a distance of 1.5' from the food dye which was the main subject of the image. The dimensions of the original photograph are 3264x2448 pixels. A low level flash was used to provide light in addition to the halogen bulbs used. It was especially important to use as little flash as possible in order to avoid a extreme amount of reflectance from the surface of the water. The aperture was rather large for the amount of light used. However, an f-stop of 3.5 was used to ensure that the entire length of the flow was captured in focus. In spite of the low level of the flash there still resulted a part of the image that contained direct reflectance from the flash. This part of the photo was removed before submission.

This image accomplishes the original goal. It makes the movement of water visible through the use of food dye. For this particular image I would like to have had an underwater camera at my disposal. This would have allowed for a capture of the phenomenon at a closer distance. For the experiment in general I would have liked to use



the flume, however, as the intent of the image has been realized the photograph is adequate.