Team First Report

Ominous Brain

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Initially, I was interested to capture the movement of dye through fluid. While I was adding different colors of dye to water, I realized that the product only looked cool for a few seconds before all of the colors meshed together and made the water black. From that point, I was trying to figure out a way to make the dye stay in one place even after slightly mixing it. I decided to play with materials with different viscosities, which resulted in a fascinating image.

For the final image, I made black water by mixing an assortment of colors and water together. Then, I poured honey and maple syrup on top of the base fluid. Using a fork, I swirled the fluids around until I was happy with the resulting image. After letting it sit for a few minutes, I went to see if the different layers had mixed. Surprisingly, it looked just like it did before. Over time, the maple syrup and honey had sunken further down into black water forming mirage like effects. All these effects together resulted in the following image. It is important to note that this was done on a small plate in a brightly lit room. No other lighting was used.

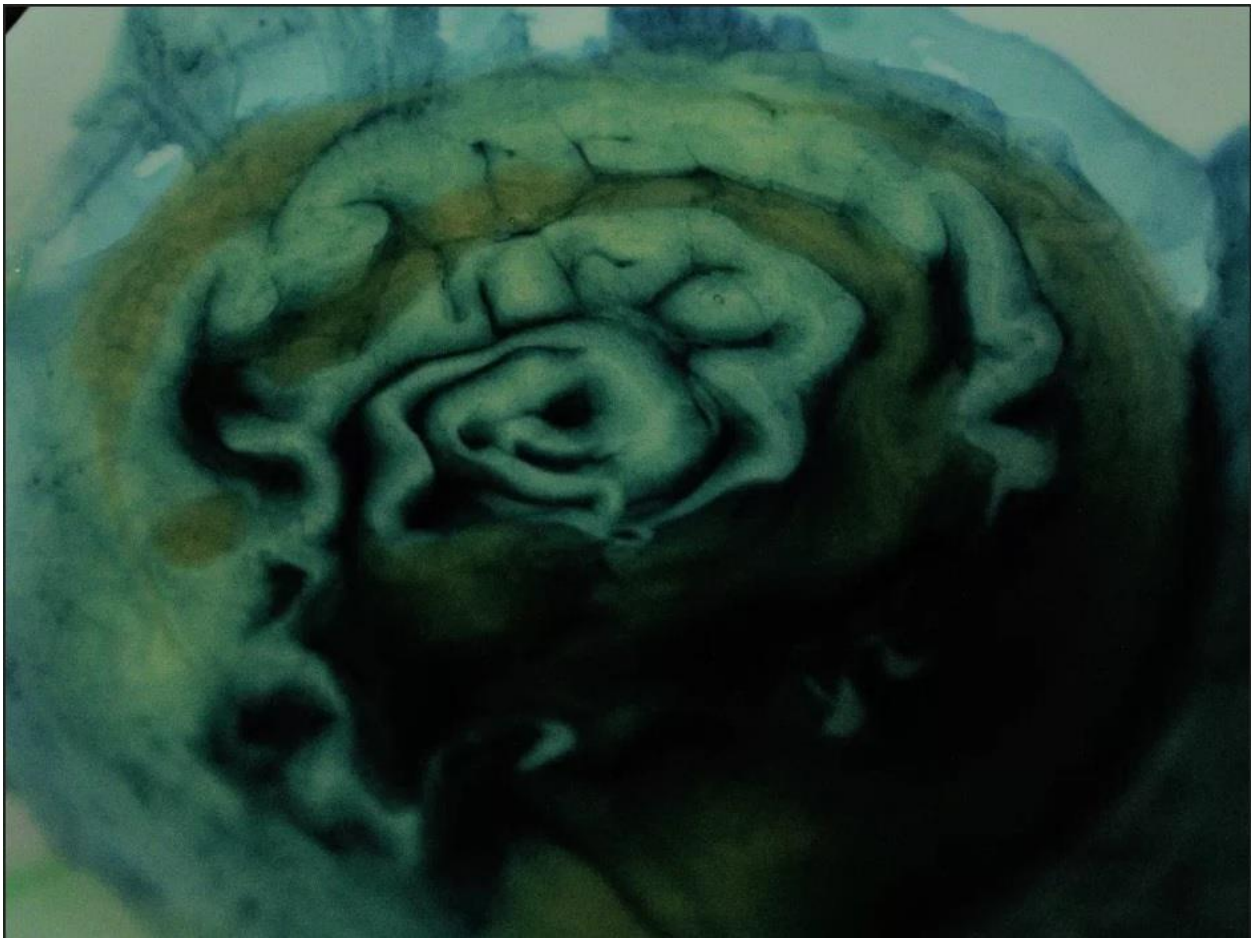

Figure 1. Team First Image

The physics behind this image is quite interesting. The different viscosities result in different shear stresses. A shear stress is just a parallel force on a fluid. It is proportional to the viscosity and change in flow velocity in a certain direction. At certain points, where the fluid isn't moving, there will be a no slip condition. At this point, shear stress is zero. While mixing, only a few points in the fluid were no slip points. After the fluids had settled, the fluids were still mixing and shifting through each other, but more points were "stable", and hence, more points were critical points. The different magnitude shear stresses are what pushed certain fluids to the top and certain to the bottom, resulting in the above image.

Red, blue and green dyes (Kroger brand) were used to create the black murky water. Aunt Jemima's maple syrup and Kroger honey were added in later. No flash setting was used, and the experiment was imaged inside using indoor lighting as the only source of lighting.

During post processing, I decreased the contrast to make the brain like structure look more ominous. I also cropped the image to get rid of wispy black trails on the rest of the plate.

Image Specifications are as follows:

- Size of field of view: 5 inches
- Distance from object to lens: 4 inches
- Lens focal length and other lens specs: 1.5 ft.
- Type of camera: Digital
- Photoshop: cropping and adjusting contrast

This image reveals how different fluids with different viscosities interact with each other. I really like how it turned out to look like a freaky brain. In the future, I would be interested in playing with lighter colors to see if a warmer image could be made.