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GUEST EDITORIAL

"*Nature's Suncatchers* Come to Life"

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I traveled to France in the summer of 2008, following a course in microbiology. While touring cathedrals, I noticed the elaborate rose windows in each building resembled centric diatoms. Somewhere between the radial symmetry and composition parallels came the big idea for my senior capstone presentation. In order to graduate with honors at Northern Kentucky University, upperclassmen are scheduled for six hours of independent study and a presentation at the end of the year. I needed something interesting to me and an audience, something that was affordable and new. Stained glass diatoms were just the beginning, but I knew they would be central to the project—the play on silicon was too good to pass up. After consulting with my microbiology professor, Dr. Miriam Kannan, she became the mentor for my project, providing an empty lab on campus in which I could work. Additionally, Dr. Kannan also began the plan for *Nature's Suncatchers* (Fig. 1) which later became the feature piece of my project.

Approximately two by three feet, *Nature's Suncatchers* was inspired by an Ernst Haeckel sketch (Fig. 2) from his book published in 1904 called *Art Forms in Nature* [1]. In the collection of sketch panels, only two featured diatoms. Many radiolarian pieces were included as well, but though these organisms also use silica deposits to build cell walls, the finer spikes and details that make the amoebae so distinctive would not have been possible to replicate in stained glass. While making patterns for the window, most of the finer details from the diatom panel were skimmed over, but at least the genus of each cell was still recognizable.

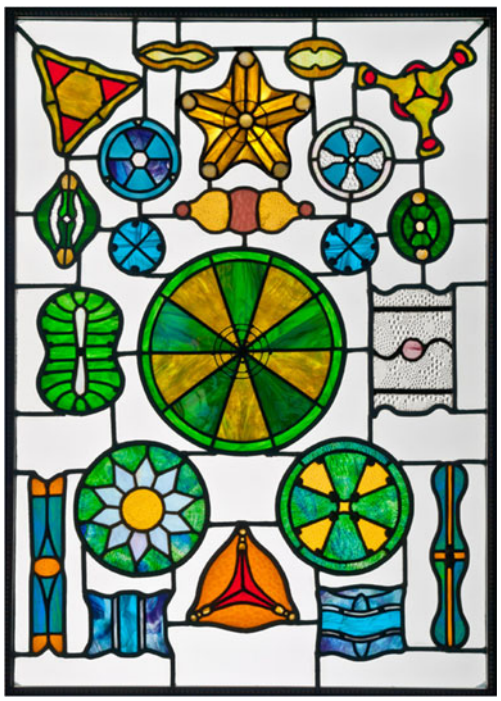

Fig. 1 *Nature's Suncatchers* by Sandra Miller

Since the Haeckel sketches were black and white, his style heavily relied on detail and symmetry; enlarging the size of the diatoms and keeping colors balanced were good ways of preserving this. Using a ruler and protractor, each diatom from the Haeckel sketch was measured in centimeters and re-drawn in inches. This allowed the individual diatoms to be large enough to work with, while at the same time keeping the overall window small enough for a single person to carry. Once patterns were drawn, the types of glass to use were carefully selected. Texture was also key in determining glass choice, since it could represent detail in

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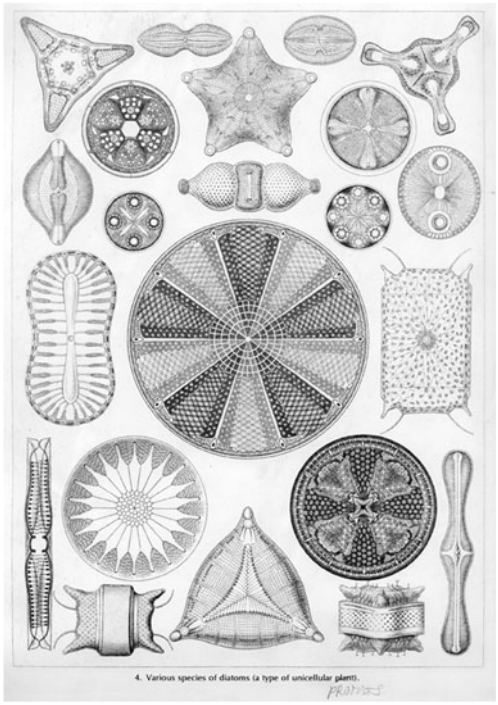

Fig. 2 Ernst Haeckel's original sketch

the diatoms that glazing couldn't necessarily accomplish. Waves, ripples, and bubbles in glass may be beautiful, but they were only used when absolutely essential. This was due to the fact that variations in glass structure make it difficult to cut accurately, and the resulting ridges are sharper than those of plain, flat glass.

Each diatom was glazed in Tiffany style, then set into clear glass using classic leaded style. Leaded glazing is the oldest method, using metal channels to form a framework that holds individual glass pieces. This is the strongest type of glazing, and is the preferred technique for making large windows, such as those seen in churches. Tiffany glazing is lightweight, but better applied to small crafts. Instead of thick, metal channels going between pieces, the perimeter of each glass piece in Tiffany-style is bound in copper foil. When a chemical called flux is applied, molten solder will adhere only to places covered by copper foil. This causes a nearly waterproof seal between each glass piece, but also results in an expansion-contraction problem when exposed to fluctuating temperatures. Leaded glass avoids this because the excess spacing between the glass pieces and metal channels provide room for movement. Though not as strong or weather-hardy, Tiffany style is the preferred method for works of art that require high amounts of detail, such as lamp shades or suncatchers. Typically most stained glass pieces feature only one method of glazing, but as a hybrid *Nature's Suncatchers* was more versatile.

The entire project took nearly eight months' worth of spare time. People would ask me how the window was coming along, and I honestly didn't know. The entire thing wouldn't be visible until it had been soldered together and strong enough to hold it up to the light. Even then, the window wouldn't support itself. The pit of my stomach fell out when I tested the corner by lifting it, and it rose six inches off the table. This had been my first attempt at the leaded technique, and I hadn't expected it. After referencing a few glazing books, the metal channels were filled with a combination of window putty and black paint. The mixture took over six weeks to dry—three weeks per side. At that point, a lifted corner would only rise one inch. The excess mixture was removed and the metal was polished and covered in black patina. A custom frame was ordered, the window was quite firmly hot-glued in with a clear glass backing for extra support. Considering how flexible the window used to be, I wasn't taking any chances. The end result was a very solid, fifty-pound piece of diatom art that snares sunlight as efficiently as its living counterparts.

References

1. Haeckel E (1904) Art Forms in Nature. Plate 4: Various species of diatoms (a type of unicellular plant)