2016

Forms and Relationships Inspired by the Natural World

George Dubinsky

Rochester Institute of Technology

A Thesis Submitted to the Faculty of

The College of Imaging Arts and Sciences

School for American Crafts

In the Candidacy for the Degree of

Masters of Fine Arts, Woodworking and Furniture Design

Forms and Relationships Inspired by the Natural World

by George Dubinsky

I. **Abstract**

My thesis body of work will investigate techniques and processes that can yield forms that are in harmony and sympathetic with forms and relationships found in nature. Using wood as my primary material, I will create a body of work that draws inspiration from trees, the way they grow, and the ways in which patterns can emerge from a tree when dissected in different ways. To achieve this I will explore techniques such as coopering in order to create shells that mimic the cambium layer of a tree or how a ripple in a surface makes visual reference to the way that curly grain appears on the face of hand split firewood. Another example would be how a table edge can be shaped similarly to the way that grain undulates or the leg of a chair can transition into the back splat with the same elegance that the limb of a tree has when transitioning out of the tree's trunk. I plan to discover forms through exploring the many stages of the life cycle of the material for example, the tree as it stands, a fallen tree cut into logs, the manifold of the intersection of tree appendages, split boards, and cross sections of trunks.

Woodworking is rectilinear in nature and as a result the natural characteristics of the wood are stripped away as it moves through the milling process. My objective is to put back into the material the beauty and the qualities it loses throughout said process. I intend to investigate form by exploring how techniques such as laminating and coopering can yield forms that resemble objects of the natural world. The structure of the tree becomes a metaphorical model of life lessons, as well as a role model for successful wooden objects. Examples of this would be the way that grain follows form, building up layers of dense winter growth and less dense summer growth. These structural qualities are one of the many ways that the tree builds strength while defining its form. I will abstract these complex qualities of the tree and showcase them by letting

them define the details in my designs. Through this exploration of form I hope to create a body of work that exists in harmony and is sympathetic with forms and relationships found in nature.

II. **Discussion of Sources and Research**

My greatest source is the relationship between Mother Nature and making which comes from my adventures in the great outdoors. While outdoors my eye is drawn to the infinite patterns, textures, and forms that define the environment. Every magical moment was formed by a reaction or condition that begins to define the object in a natural, almost effortless way creating beautiful moments that tell a story of their creation. Hermann Hesse describes a perfect example of this beautifully and concisely in his book *Wandering*:

"Trees are sanctuaries. Whoever knows how to speak to them, can learn the truth. They do not teach learning and precepts, they preach undeterred by particulars, the ancient law of life."

It is this spiritual connection to nature that provided me with the inspiration for my work. I conspire to give new life to the tree by breathing life into a new form while respecting its origin. My tools are only an extension of my efforts to respect the materials. George Nakashima explains the connection between man and his materials, in his book *The Soul of A Tree*:

"There must be a union between the spirit in wood and the spirit in man. The grain of the wood must relate closely to its function. The abutment of the edge of one board to an adjoining board can mean the success or failure of a piece. Gradually a form evolves, much as nature produces the tree in the first place. The object created can live forever. The tree lives on in its new form. The object cannot follow a transitory "style", here for a moment, discarded the next. Its appeal must be universal. Cordial and receptive, it should invite a meeting with man."

I view some of my favorite builders as makers that have a great knowledge of their material and how it reacts in different conditions. They know how different tools will leave marks and change the form and surface. A woodworker understands how the wood grain is in line with the tree's form and if the grain is used to define the form of an object in a similar way it yields a stronger form. James Krenov is one of the makers that I admire; his beliefs connect closely to how I view my process. Krenov founded the fine wood working program at the College of the Redwoods, upon his death the shop technician there, David Welter spoke of Krenov in a 2009 *New York Times* Article:

"He worked with material rather than on material; it wasn't a matter of conquering the wood."

During the making of my body of work I was challenged to find makers that manipulate the material in ways that agree with my thought process and to find those whom provide contrast to my way of thinking. Stack laminating is often used to stack chunks of material to the form rather than orientating the grain to the form. An example of this would be Wendell Castle's collection "Wandering Forms: 1959-1979".[1] Castle's technique is to create a piece of unidirectional material and subtract into it opposed to constructing the form from pieces that lay the grain in the direction of the form. On the other hand, the technique of strip laminating can be done in a way that is agreeable to the form, Jere Osgood often uses this technique, which can be found on the legs of the "Elliptical Shell Desk".[2] This piece has tapered curving laminations that resemble the tapered curves of a tree. In most of Osgood's work there is an obvious relationship between the forms that one is influencing the other. When strip laminating the grain follows the form, short grain is avoided, and the material becomes inherently stronger. I utilized strip laminating in my "Cadmium Cabinet" and on the leg of my credenza.

Utilizing the strength of the tree is important in my designs. I select boards with complementary grain patterns to the shape of my parts to help match the grain to the form. I've chosen on many occasions to have a conversation with the material as opposed to applying parts to the material with lack of awareness. I use the tree as the formal source material for my forms and try to recreate what was lost when the material goes through the milling process. I take the pieces of character and reassemble them in a way that provides functionality while at the same time brings back the tree's soul. When designing an item I understand that the design isn't fully resolved until I'm having the conversation with the material.

Creating metaphorical representations of nature's influence offers me more creativity to interpret the material in my own way by following the sensibilities of the natural world. Wharton Esherick, one of my biggest inspirations, used character grade material for its unique shapes and imperfections. He allowed the material to influence the work; he rarely used ninety-degree angles, as more soft obtuse angles are found in nature. His shapes resemble rocks and trees and architectures of the natural world. He had unsophisticated machinery which enabled him to work more closely with the forms. The Fisher desk, one of his most technically executed pieces, utilized wood to mimic the shape of a rock.[3] I find Esherick's work respectful to the original form and satisfies the desire for furniture and sculpture to be in harmony with nature rather than fighting it.

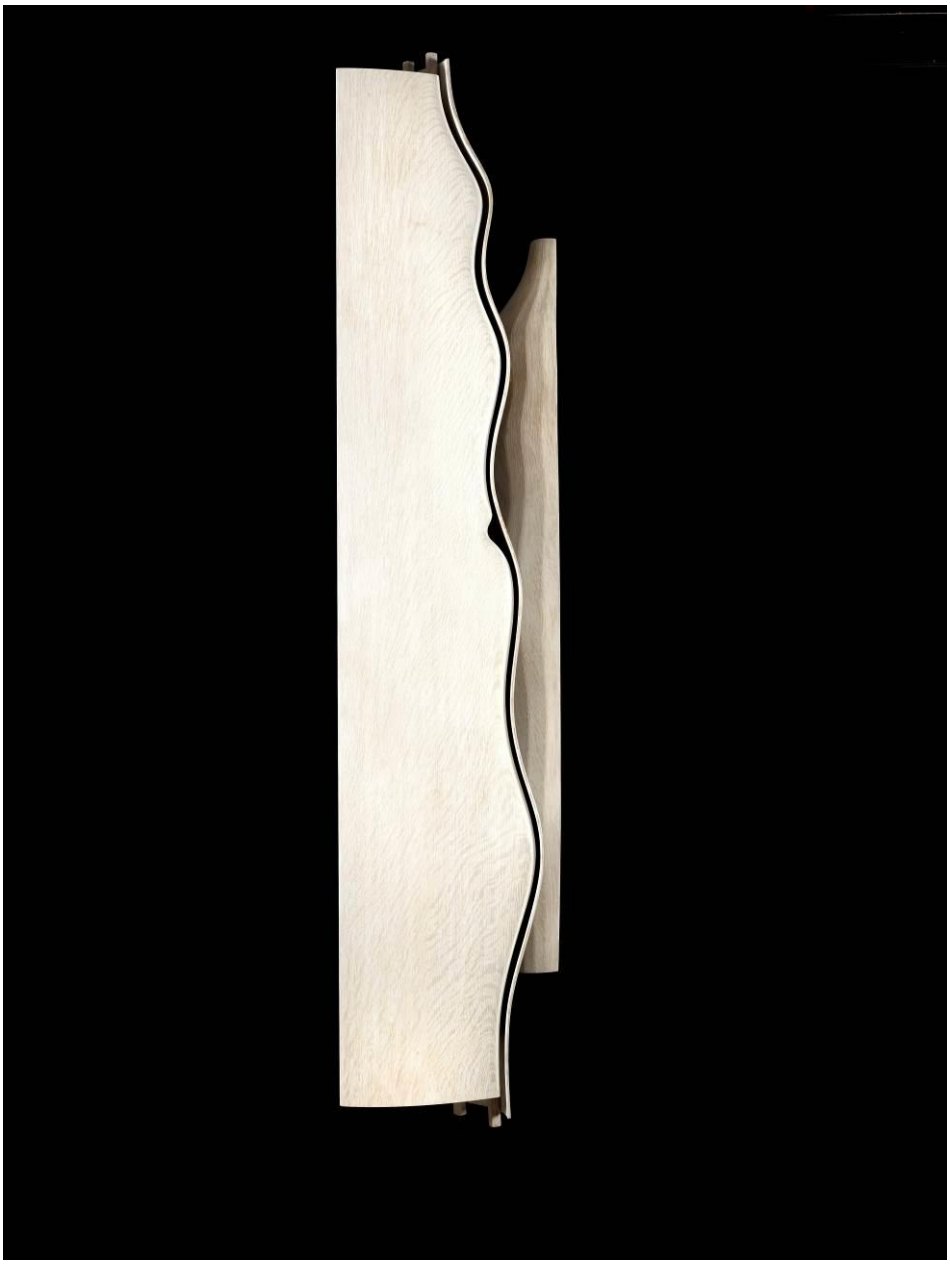
Aside from makers I also gain inspiration from science. The Golden Section is a rule that is based on proportions. When designing I utilize golden section proportion sets to determine loose

guidelines for the overall thickness, size, weight, and height. I believe this practice, which is derived from nature, helps to elevate the overall appeal of my pieces. The tree is a physical representation of the Golden Section and can be seen in the way that the diameters decrease as the form moves upward and outward, the spacing between tree branches, and even the formation of leaves. The ratios provide a relationship between all elements and give a feeling of harmony and balance from which the piece can grow.

III. Critical Analysis

In an effort to have the technique follow the concept I focused on the tree. The forms and the activity of dissecting and reassembling the tree in an abstract way drew me in. As a maker it is easy to get stuck behind the design. I wanted to get out from behind the pen and paper and let the material speak to me. In this body of work I wanted to explore the qualities of trees at their many stages from growth to maturity to material. In my first year of graduate school I designed and built what I called The Cambium Cabinet. When conceptualizing my thesis I looked back at this piece and I realized how important the tree was as an inspirational figure to many wood-workers including myself. Instead of seeing the tree as simply my tool I view it as my teacher. Before I designed the Cambium Cabinet I was lost and could not focus or commit to one direction worth pursuing. I was putting feelers out by making more conceptual work instead of letting the functionality be the priority. I was trying to do too much with my pieces and they left me feeling confused and disappointed. The pieces I worked on before my thesis did not feel real, they lacked direction and did not come from a meaningful place. After realizing this, I began to focus on what was important to me as a person and as a maker. I spent a lot of time outside climbing, camping, and backpacking in the forest with the trees and rocks and was very comforted by it.

The forms, textures, and qualities of that environment were what provided said comfort. I wanted to capture those qualities and bring them indoors through my designs.



The Cambium Cabinet design came out of me wanting to build a cabinet that referenced the organic surfaces of a tree. I wanted to take the idea of the shell, the skin, and build a cabinet out of it. The shapes that logs go through when becoming quarter-sawn material inspired me. White Oak is commonly cut quarter-sawn for its prominent medullary grain pattern. The first step is to

quarter the logs which yields forms similar to this cabinet. The flat surfaces on the cabinet are constructed with quarter-sawn material, the same grain orientation that would be seen in the log divided this way. The cabinet is a juxtaposition between the man influenced wood surfaces and the nature influenced wood surfaces. I assigned the strip laminating technique to this piece because of its ability to imitate the undulating curves of the cambium layer. The process of laying out the framework of the cabinet was an organic one. I had to react to the changes in the material and the way that it wanted to teach me. At every step the material had a mind of its own and a conversation would arise between the material and myself. I answered the design challenges that came up by thinking about how the tree would handle that situation and to constantly design a solution. I began to build a framework that the shell is mounted to with vertical elements that took on a tube like quality of the tree's grain. The tube-like laminations were fastened to horizontal shelves, thus mimicking the part of medullary rays of a tree. Medullary rays carry nutrients from the cambium layer to the heartwood. This metaphor for the anatomy of the tree provides a functional outcome for my design. I purposefully refrained from exposed joinery because the piece is about the tree, not about my skill-set.

The Cambium cabinet and the Credenza both have the same pulls. The shape represents the way the grain flows around a knot. The Credenza design was an extension of the cambium exploration, this time integrating the pull detail into a field of slats that show how an interruption in grain dissipates throughout the layers. This was also a way for me to make a visual cue for the user to know where doors and drawers started and stopped. A door typically has hard edges and a central panel that represent the feeling of individual doors where with the Credenza I wanted to create a feeling of one seamless composition when all doors were in their closed position. In my

attempt to abstract parts of the tree and assign those parts purposes I began to imitate the bark to create the shape of the credenza's back. I felt this was important because a cabinet's back is put up against the wall and proper attention is not paid to the back. I wanted to create a composition that was equally intriguing from its rear prospective as it was from its front. The subtle curve of the back peaking up from the top gives that space a subtle dynamic. The top edge of the back is thin and the bottom edge is thick, tapering like that of a tree. Instead of a traditional base I utilized the tube to abstract a piece of grain. Grain is a series of tubes so I isolated one and assigned it to the foot. The tubular foot can also represent, as do the door pulls, the grain flowing around a knot. The drawers can be pulled from the bottom or the top. I purposefully limited the amount of interruption for pulls and kept the pulls in the field and away from the perimeter, which allowed a cleaner composition. The oak doors stick proud of the maple drawer fronts to suggest different layers in the tree. For instance, bark and the inside grain which are typically different colors or the sapwood and heartwood, which are also typically different colors. The qualities of the tree that I represented in this piece were loosely abstracted and collaged to create this work.

The Avodire table, my third piece, was also abstracted from tree forms. A tree radiates from its pith center, which was once the start of the tree. The main surface of this table is constructed from tapering wedges that radiate towards a central half tube that represents the trees pith. A hand split piece of firewood is where I drew my inspiration for this piece. The two planes creating the back support mimic the split surfaces of the log. The two faces are slightly skewed from each other referencing the radial contraction that the log undergoes as it dries out. I wanted to imply volume but at the same time keep the construction light and airy. The opposite side of the table and its cantilever construction allows for minimal structure. The top represents an organic cross-section your mind can begin to extrude along the shield's path. Mentally, one can complete the absent volume. With this interpretation of the log I was able to create a piece that implies solidity but in fact is an outline of a form that allows your mind to fill in the gaps. In this same vein I utilized the ability of the mind to fill in missing information with the Stump table.

The Stump table implies a solid form but in fact is a hollow piece. The missing wedge allows the table to expand and contract in its radial orientation throughout the seasons. The thin slot in the table's side provokes an investigation into its hollow interior. The staved ends of the table were left raw to illustrate that it's a segment of a larger whole. The sides of the stump table taper in thickness from bottom to top similar to the back of the Credenza.

Similarly to the previous three pieces, the Grove Lights utilize tapered staved construction. With this construction I can create radially derived forms that break out of the rectilinear rigidity of

more traditional forms of construction. The lamps, a more conceptual piece, represent a grove of evergreen trees that I saw while snowboarding in the mountains. The groves are nestled in the same way that Evergreen tree branches overlap. Underneath the Evergreens a shelter is created and an environment made. I wanted to represent that area of the trees with light. The light pours out of the bottom and creates intrigue into what lies inside. The piece provides ambient light and engages the viewer from a distance and draws them in to discover the piece as a whole.

My last investigation involved how a different material such as porcelain slip can create layers of form. I used a piece of Douglas fir 4X4 that had vast annual ring segments. The winter growth is denser than the summer growth because the tree receives less nutrition. When sandblasted the summer growth erodes at a much faster rate than the dense winter growth and reveals a texture. The slip casting process creates a product that is a layer of material that relates to how trees grow

one layer at a time. I wanted to cast the surface of the tree into a mold that represented the piece of Douglas fir as a hollow vessel. I stepped out of my comfort zone to try and understand how another material might be able to pick up on some of the qualities of wood where wood itself falls short. Utilizing slip, that inherently wants to create hollow forms, I was able to cast into a mold that was pulled from a solid wooden object. This process allowed me to capture the detail of wood while utilizing the properties of porcelain. I was able to preserve the wood grain by created a three dimensional representation of the grain's densities and its seasonal patterns.

IV. Conclusion

Through this body of work I have investigated techniques and processes that yield forms in harmony and are sympathetic with the forms and relationships found in nature. Trees have been

the main source of inspiration in this work and have allowed me to approach construction techniques differently. By using the tree as a model to develop new approaches I am able to pair these qualities with appropriate techniques that compliment and listen to how the tree wants to be shaped and formed when building.

Before I began this body of work I was trying to create soul and personality in the work instead of letting the work itself show the soul and personality of the tree. By observing the tree's natural forms and patterns as the driving force the work began to develop itself and allow me to guide it along. As new design challenges arose I could go back to the source, the tree as visual model, a teacher, and find inspiration and solutions.

The immense respect I have for the tree began by spending time outdoors. In their midst, I learned and still believe that the tree is a metaphorical model for many of life's greatest challenges and questions. For example, a tree grows in a subtle spiral as it tracks the sunlight; this spiral allows the tree to rotate as it bends in the wind. It bends and moves with its surroundings and is not rigid which allows it to better handle stress and the threats of the natural world around it. Thus, the tree teaches us to be able to move and grow with life's challenges instead of fight them. After making this spiritual connection I became more interested in the solutions that the tree had to offer in designing and making functional objects.

By expanding my inspiration from trees to all objects in nature I learned that by looking at nature's materials as a whole each material has its own inherent ways it wants to be worked and the qualities it wants to express. I think that there is a natural element that can be found within

the making process, the path of least resistance. This approach yields smart, efficient forms. Utilizing the path of least resistance, not as a way to do less work but as a way to work smarter with the material not harder I am able to utilize the inherent qualities of the material and find strength through process.

This approach can yield a lifetime worth of work, using nature as a metaphorical model. For instance, rock formations often replace the tree as a model when forms wants to embody facets, hard angles, and irregular planes. Snow drifts exemplify this by how the snow does not resist the wind and lets the wind produce undulating lines and irregular edges. By studying these forms that have naturally shaped and shifted over time one can start to imagine the types of forces that created the shapes and curves and be able to understand the story of their creation by reading their appearance. This way of thinking has led me to design in a way to see the true natural properties of a process and doesn't force arbitrary outcomes or expectations. The underlying structure of pattern and decision-making found in nature is a guide for successful objects and a successful life. Looking at nature for inspiration and life lessons rather than just seeing materials at face value has made me a better maker, person, business professional and has bettered my relationships with all living things. By provoking the viewer to discover what is beneath the cambium layer I too learned more about my process, my materials, and how I view myself as a maker and a person.

V. Bibliography

Hesse, Herman. Wandering. Farrar Straus & Giroux, New York, 1972. Print

Nakashima, George. The Soul of a Tree. Kodansha USA, Tokyo, 2012. Print

Hevesi, Dennis. “James Krenov, Wood and Word Worker, Is Dead at 88”. New York Times. New York, 2009. Media

VI. Works Cited

[1] Fein, Sandra. “Wendell Castle.” *Artforum.* Artforum International Magazine. 13 November 2012. Web. 10 Oct. 2015.

[2] Ward, Gerald. The Maker’s Hand: American Studio Furniture 1940-1990. MFA, Boston, 2003. Print

[3] Bascom, Mansfield. Wharton Esherick: The Journey of A Creative Mind. Abrams, New York, 2010. Print