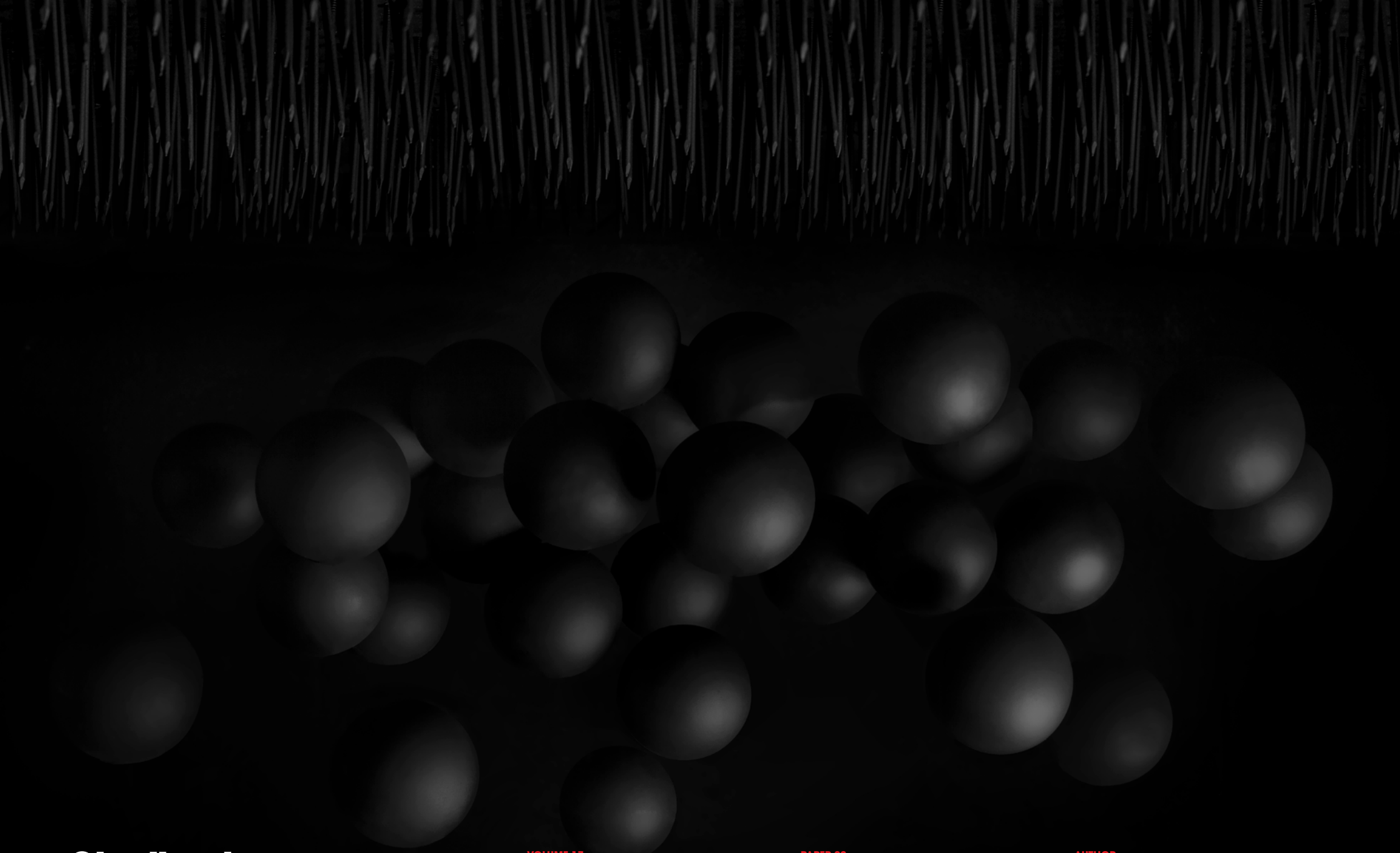

Studies in Material Thinking

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Multisensory materialities in the art school

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The collection as a making tool in the classroom

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ABSTRACT

As designers of made objects, our work is demonstrably better when informed choices about materiality and fabrication are applied. Though many texts and publications exist that describe wooden fabrication methods with text and drawings, design students have a deep connection to haptic experience, to visual learning, and to objects. The Stickley Museum is a collection of American Arts and Crafts furniture, as well as a broad collection of other historically important furniture type-forms. When the construction techniques of that furniture are replicated by students, new ways to read objects are revealed—analysis of the construction of an existing object exposes students to choices about materials and fabrication methods that are difficult to replicate with other teaching methods. Though using a museum as a research tool is a long-practiced educational method, using it as a way to understand materiality and fabrication as a tool for design students has a special relevance—for those who design objects, the intersection of functionality, materiality, and aesthetic reality must be carefully considered if our work is to be successful.

KEY WORDS

Museum, haptic, learning, materiality

FROM ROOTS TO RESOURCES

For at least 7000 years, humans have used mortise and tennon joints to join two pieces of wood at right angles to each other. The absolute appropriateness of the joint, the molecular makeup of wood as a material, and the ease of creating the joint with limited tooling have ensured that it maintains a relevance that dates back to Neolithic water wells and quite possibly earlier (Tegel, Elburg, Hakelberg, Stäuble, & Büntgen, 2012). Historic examples abound in artifacts, in manuscripts and, of course, more recently in 'how-to' articles, books, web sites, and blogs. Though a myriad of books, popular magazines, websites, and videos abound to show how a mortise and tennon joint should be laid out, marked, cut, and fitted, most of these leave out an important educational component: the why.

As is often the case in a craft pursuit, the geometry and proportions (not to mention the underlying logic of the joint itself) are not accidental—they have been developed over thousands of years, undergoing constant refinements as tooling gets more precise and client expectations change. This fact tempts the teacher to simply describe the joint and, if pressed at all, to fall back on 'tradition as teacher' without necessarily explaining (or in some cases even understanding) the theory behind the choice-making. Much of craft teaching assumes this dogmatic form of content presentation, in which 'technical skill has been removed from imagination' (Sennett, 2008, p. 21); for students of craft this is often enough information to work with in order to produce a strong joint.

When training design students, however, the approach falls short. Instead of being emerging artisans, intent on honing a craft over time to the point of mastery, a design student is learning about a variety of materialities, techniques, tooling sets and fabrication approaches that may or may not be brought to bear on the product, space, or interaction that the student designs. Design students are being trained to evaluate the relative merits of formal and functional choices across this range of criteria. Because of this difference, an alternative training approach must be used to make sense of the project.

Living as we do in a time of immediate access to digital information, there is of course no shortage of drawings or photos for the student of any craft. The glut of 'how-to' videos and websites is so profuse as to be cumbersome, and the lack of vetting leads to videos or other internet-available media being untrustworthy in some cases and at their worst unsafe. A quick internet search is not enough, a mixture of research tools must be used.

Matthew Crawford, in his influential book *Shop Class as Soulcraft*, writes of the shift in general education from 'knowing how' to 'knowing that'. He writes:

> *This corresponds roughly from universal knowledge to the kind that comes from personal experience. If you know that something is the case, the proposition can be stated from anywhere. In fact such knowledge aspires to a view from nowhere. That is, it aspires to a view that gets at the true nature of things because it isn't conditioned by the circumstances of the user. It can be transmitted through speech or writing without loss of meaning, and expounded by a generic self that need not have any prerequisite experiences. Occupations based on universal, propositional knowledge are more prestigious, but they are also the kind that face competition from the whole*

Figure 1: Wooden stools built by students in the class using mortise and tennon construction. Photo by Zeke Leonard

world as book learning becomes more widely disseminated in the global economy. Practical know-how, on the other hand, is always tied to the experience of a particular person. It can't be downloaded, it can only be lived. (Crawford, 2009, pp. 161-162)

It is with this view in mind that my *Fabrication Skills* class is offered—students in this class work to begin to *know that* as Crawford writes, experiencing haptically the fabrication methods that are appropriate to making wooden furniture. Wood as a material especially has enough variation when worked that it is nearly impossible to learn to adjust to its foibles without directly engaging it in a making process. As a part of this class, students fabricate a 'leg and rail' style footstool out of maple. Beginning with rough-cut lumber, they dress the material, dimension it, cut and fit joints, assemble, and finish the stool themselves. For many students, this is the first time that they have engaged a making process that is this knowledge and labor intensive, or as complex. Even students that have engaged wood working projects in their past (which is very few of them at my university) have typically not had access to the tooling necessary to complete this task or the knowledge base that is applied.

Just under seven miles from the teaching shop that I use at Syracuse University is the Stickley Museum.[1] Located in the old Stickley Factory, it was instituted eight years ago by the Stickley Audi Corporation, which owns the museum and the pieces it contains. This small museum receives only about 2000 visitors per year and houses an important collection of historic furniture. One quality that makes this an important collection is the variety of vintages of wooden furniture objects, allowing the student of commercial wooden furniture-making to perform the kind of evaluative work described by E. McClung Fleming (1974, p. 157) across a variety of type-forms.

Several pieces have been partially disassembled to show construction, or mock up examples of joints have been made that have a direct correlation to the furniture piece in the collection but that are available

[1] Now called the Stickley Audi Company, the five Stickley brothers were furniture designers and makers as well as savvy businessmen that owned furniture production companies together and separately in the late Nineteenth and much of the Twentieth Century. Based first in Grand Rapids, Michigan and then in Central New York, Gustave Stickley is credited with inventing the 'Craftsman' style of furniture, and promoting it through his Craftsman magazine as well as other outlets.

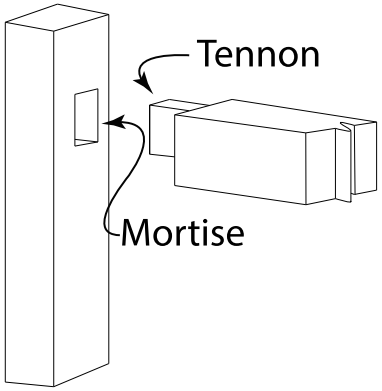

Figure 2: Through-tennon construction on a Stickley settle on view at the Stickley Museum. Photo courtesy Stickley Museum.

to be held and interacted with. This has two effects: It engages the sense of touch in students who are likely to be haptic learners anyway, and it makes a direct connection between what the students are learning in the classroom and the pieces of furniture that are presented in the museum. These simple display joints allow research and discussion across all five of Fleming's basic properties (Fleming, 1974, p. 156). When looking at the property of construction, for example, holding an example of a mortise and tennon joint in one's hand allows one to directly experience the mechanical advantage afforded by the shoulders on the tennon in a way that cannot be experienced from a printed page or a web interface.

The students visit the museum after several class meetings, in order that they have had ample time to get used to the concepts that we are applying to our furniture objects. As we walk through the museum and examine the objects, a very deep conversation is possible, as the mortise and tennon joint is highly celebrated in Stickley Mission Style furniture. One student, Jessica C. said as we analyzed a chest of drawers: 'I never thought that something I made could last for a hundred years.' The idea of this kind of longevity is not inherent in the experience of Millennials, a group that also has been at the forefront of the shift from analog making contexts to digital making contexts. By examining and evaluating the objects in the museum (some of which are centuries old), the students have a new context for the possibilities inherent in an object that is designed with sensitive consideration of material and construction realities. The museum legitimizes the course work for the students and the course work demystifies the museum objects. The overlay of value and curation implicit in placing an object in a museum indicates to the students that the qualities of the objects they are looking at are relevant and valuable.

NEW CONTEXTS

Upon returning to the classroom, the students return their attention to the task at hand: Cutting mortise and tennon joints. The external criteria that have been placed on them prior to the museum visit (dimensions of parts, tightness of fit, etc.) are now augmented by a new set of criteria—those of the aesthetic realities of a well-fit joint and the set of tolerances necessary to make the joint strong. One student, Tori T, reflected: 'I had not realized how many pieces of wooden furniture used a mortise and tennon! It's everywhere!' Though at this point she had been working for three weeks to make this particular joint, she still had not made the contextual connection to the application

of the joint beyond the classroom. The visit to the museum connects the coursework to the world at large in a way that is real and immediate to the student.

They are a guidebook to achieving excellence.

In addition, the pieces at the museum, being of a very high quality and level of finish, inspire the students to emulate the evident skill. In a sense this gives the students an assessment rubric, a way to judge their own finished work. Richard Sennett points out that 'all craftsmanship is excellence driven work' (Senett, 2008, p. 24). I would add the caveat that one way to articulate 'excellence' in a craft object is to find an existing object to emulate. The furniture objects in the museum provide that example—the joints are tight and stand up to very close visual scrutiny, and all of the shoulders are straight and closely fitted to the adjoining piece of wood. In addition, the museum provides a chance to talk concretely about both materiality and production processes.

The Stickley company has historically been open to the latest production processes, and as the students analyze the pieces in the museum the conversation often includes not just the form of the component parts (a mortise, for example) but also the manufacturing processes used to form them. The history of manufacture, cultural expectations about the qualities that contribute a 'well-made' object, the responsibility of the designer to the maker and to the client all become topics of conversation as lensed through the objects in front of us. These cease to be simply old chairs and tables and become what Michael Buckland (1991, p. 352) calls 'information-as-thing': They are a guidebook to achieving excellence.

So the conversation is many-layered—the aesthetic being informed by the materiality, but also by the methods used to achieve the finished object. None of these qualities (aesthetic, materiality, methodology) can be fully understood without the others, and all of them of course require a conversation alluded to above that the museum also fosters: That of context.

APPLICATION

It is context that is perhaps most important for a designer. We cannot know how to start designing if we do not have access to the context within which our product will be used. There are other contexts, of course: materiality, production processes, lifespan of the object, and shipping costs all become part of the conversation as an object is designed and produced.

The Stickley Museum helps to bring these conversations to the fore—the very location of the Museum, in an old Stickley factory, starts the conversation. The factory was built in Central New York State because it was geographically well-suited, because the raw material was near at hand, and because a large local market existed. Even in the current consumer climate (one with expectations of immediacy of delivery for finished goods) these factors come heavily into play—as consumers expect ever-cheaper goods, the cost of shipping and transportation of raw materials and finished goods figures heavily into manufacturing processes.

These production parameters are a crucial part of the conversation. As an example, libraries and

other facilities are making 3D printing or other rapid prototyping methods available to people inside and outside of the design world, often with interesting results. (Britton, 2012, p. 2) What these facilities offer, however, is the ability to copy form without applying knowledge of the contexts that have driven that form. School children may print a figure of their favorite television character, but this method of making is far less efficient and far more resource-heavy than injection molding or casting. Although it does put one kind of making process into the hands of many people, it does so at the cost of educating the makers about the rich web of contexts (material, production, lifespan) that come in to play in any making process. This kind of formal mimicry falls flat in the long term. Another approach is necessary as we train the designers of the future.

The intention of my class is not train furniture makers per se; rather it is to give design students the opportunity to dive deeply into a single material, and in so doing to help them to understand the depth of possibility offered by all materials. Design by its nature implies a materiality, and a sensitive designer can leverage that materiality to create or increase value. Good design includes aesthetics of course, but extends beyond that to construction and materiality that demonstrate an understanding of the responsibilities implicit in designing an object with a given life-span, whether that be ephemeral or enduring. If the object is intended to have a fleeting use or existence, an understanding of materials and construction can lead to an object that easily re-enters the resource cycle rather than the waste stream. Conversely, if the object has an intended use that is not temporary, the designer's responsibility is to specify or apply materials and construction techniques appropriate to that longer life.

If we are to create spaces and objects using 'long term sustainable considerations' (see William McDonough Architects, 1992, p. 6), the museum, which is after all a repository of such objects, provides a compelling place to seek out models and examples. Kathryn Sederberg (2013) pointed out that there is a prevailing sense of a dichotomy between learning about objects in a museum and enjoying objects in a museum. She writes that 'as educators we need to bridge this false divide by harnessing the aesthetic experience to engage students to make meaningful connections to the objects in our classroom 'archive' (Sederberg, 2013, p. 253). On our museum visit we do learn about the objects, but more importantly we learn from them. By analyzing the lessons learned from the objects and applying them in the making classroom, we are able to inspire young designers and lead them forward. Learning how to make a well-crafted joint in wood leads to informed experimentation in other contexts and other materialities and reinforces the need to be sensitive to many layers of context and to respond to those layers. Using the museum and its collections as a tool for contextualizing designing and making both enhances and advances the student ability to design in a thoughtful and relevant way.

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