Crafting Agency: Head in Hand

by

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Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

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Abstract

Through a typology of leather artifacts this thesis aims to examine the value of craft with an architectural mindset. Contemporary craft is no longer a labour of necessity, instead, agency over artifacts which surround our everyday life draws many individuals to devote time and energy to such activities. The investment of time and care into objects that are created with materials and tools gathered by an individual is a rarity in this world of instant gratification.

Leather has specific qualities that make it an enchanting material to work with; durability and breathability being two characteristics that make it hard to imitate artificially. In crafting these items, I became intimate with leather as a material, its texture, where it is sourced, how it ages and gains character, along with the tools I use.

Each artifact is a medium in which an investigation into the philosophies behind making, design and a way of life takes place. With these considerations in mind, it is easy to draw parallels to a thoughtful architectural practice.

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1 Beginnings

I have always been interested in making things with my hands and my creative endeavours have always taken place in impromptu spaces of opportunity rather than any specific space dedicated to the art of making. Being part of a first-generation immigrant family meant I spent the better part of my childhood and adolescence moving around with my parents before settling in a small townhouse in the suburbs of Toronto. It was a chaotic and homely place, though the clutter intensified over our 15-year habitation of the space. My parents did their best to provide a nurturing environment for my brother and me. They never complained when I started one of my projects, whether it be an awkwardly sized painted, crafting a Chinese folding fan or wood carving, they bore it all with remarkable fortitude. Often, I would take over the living space for weeks on end. In that tiny townhouse, the ground floor only contained a kitchen and living room, so when I say I took over the living room, it meant that I took almost half of the common space in our house. But it was within that space that I began my creative journey, that I created the pieces for my portfolio to apply to architecture programs. It is also within that space that in my darkest moments, I sought solace. Time and time again, when I doubted myself, I found myself going back to doing what truly brought me joy; working, designing and making with my hands.

1.1 Agency

Through my own experience and observations, impromptu spaces are the ones that foster creativity and give agency to those who lack it. In short, there will never be a perfect time or space to start creating. Those who have the desire to do so, just start. Only by starting can one build up experience and knowledge, which in my opinion is the foundation of agency.

I have been throwing around the word ‘agency’ and I think it is time to define it. In broad strokes, agency, as defined by the *American Journal of Sociology*, can be divided into three parts; iteration, projectivity and practical evaluation. Iteration is where the past can affect present decisions and patterns are built. Projectivity is the ability to imagine the future consequences of decisions of the present. Lastly, practical evaluation is how the context and situation will affect each decision an individual makes.[1] There is much discussion behind this simple word

and to quote Tim Ingold on this topic, agency “has been discussed ad nauseam, and it is beyond the scope of this chapter to review the literature that has amassed around it in any depth”.[2] In this thesis, I am not so concerned with the boundaries of its definition but rather how craft can create an environment of agency. Perhaps an even simpler definition of agency is needed; it is the ability of an individual to make choices and take control of their lives. It is about the individual having autonomy over the circumstances that life has dealt.

Often in discussions about agency, structure is never too far behind. Structure, in this context, is any limiting factor on agency, not to be confused with concrete or steel, structural components within buildings. By that definition, there is almost an overwhelming number of factors acting on the agency of any person alive today, and more specifically, any craftsperson. Let us focus on the craftsperson; perhaps the two most overwhelming factors that stand in the way of starting a new hobby are time and money, but space is not too far behind. There are new tools to buy, and raw materials to be sourced, not to mention the learning curve that naturally comes with acquiring new skills. At this point, the inevitable question of whether it is worth it begins to creep up in the back of the mind, after all, it would probably be cheaper just to buy the thing rather than make it. Modern advancements may have gifted us with many conveniences but in turn it has taken away our connection to the world around us and our ability to thrive independently.

It is also exactly why some people, myself included, pursue and fall in love with craft. Through craft, I can achieve a sense of agency that is both empowering as it is exhilarating. In the act of making, there is a semblance of control over one’s surrounding environment, and there is comfort in that. Though it may be a thinly veiled illusion of control created so that I buy more crafting tools, the artifacts I make for myself and the people I hold dear are lasting. Slowly, the experience and knowledge that is built up will factor into my decisions in other areas of my life and thus building positive patterns into my lifestyle. Going back to the definition of agency, patterns are a part of iteration and iteration being part of agency; thus coming full circle. Through craft I begin to seek out a community of like-minded people who are also creating and making simply out of the joy in the act.

1.2 Craft

In beginning to research this topic, I encountered numerous introductory chapters that endeavored to separate art from craft or include art in craft or craft in art. Richard Sennett, in *The Craftsman*, argues that "(t)he craftsman is a more inclusive category than the artisan"[3] whereas Tim Ingold argues that through an anthropological lens that art should extend to include craft.[4] On the other hand, Glenn Adamson insists that "craft's inferiority might be the most productive thing about it".[5] While craft may be perceived as inferior by some, there is the general sense that craft has some value and the act of making presents an attraction to some people that cannot be found elsewhere. Although I do recognize that most if not all the books I have read have a bias in favour of craft.

Again, I feel that there is the need to gently remind the reader that this thesis is not so concerned with the boundaries of such distinctions between craft and art. Rather, I would much prefer to muck about in the middle of such definitions if possible. With that said, there is one particular definition of craft, or rather craeft in this case, that I quite adore.

> "It's about more than just making. The goal, in being craefty, is not to use as much as possible of the technology and resources you have at your disposal but to use as little as possible in relation to the job that needs undertaking. This is the resourcefulness in craeft. Having physical adeptness, strength and fitness represents the power in craeft. And finally, understanding the materials, making critical decisions about how to approach the work, and factoring in wider financial and time constraints represents the knowledge in craeft."
>
> - Alexander Langlands, *Craeft*[6]

Langlands explores much of the pastoral practices of rural England in his book *Craeft*, highlighting again and again the resiliency of methods and knowledge that may seem antiquated to some. Nowhere does Langlands mention agency, but in his admiration for the efficiency and efficacy of craeft without turning a blind eye to the urgencies of resources of the day-to-day, he has captured what agency looks like to the farmers of England.

After all, what better way to take control of the choices and circumstances of life than by utilizing knowledge of the land to take advantage of weather, topography and time to make a living. Though that level of independence is currently out of reach for a city dweller like myself, it is, perhaps, a good goal to have in mind.

1.3 Head in Hand

> "...the subtlest of all machines, which is the human hand. No machine yet contrived or hereafter contrivable, will ever equal the fine machinery of the human fingers."
>
> - John Ruskin, *The Two Paths*[7]

From the humble hand axe to great works of art and architecture, humanity has relied on these appendages at the end of our arms to survive, imagine and create. Even among the five senses, touch and sight have a unique relationship. Our hands are hardwired to do more than grab, the sensory feedback in our fingertips also helps fill in the gaps of sight. Whether it be touching produce in the grocery store to make sure there are no hidden soft spots of decay or running a hand along a piece of wood to feel the minute bumps and ridges invisible to the naked eye, our fingertips send a plethora of information back to our brain. Richard Sennett likens calluses on the craftsman's hand to zoom lens on a camera. This may seem counterintuitive at first but, the calluses protect the hand and make it less hesitant in the act of probing.[8]

Sennett delves deeper into the subject of the hand by devoting a whole chapter in *The Craftsman*. In it he explores how technique is the steppingstone to expression, how the unity of the head and the hand leads to prehension, the anticipation of action before sense data. He gives many examples, ranging from playing string instruments to the Chinese chef's use of a cleaver.[9] In each instance, the vision of a coordinated dance between the head and the hand is brought to mind.

Sometimes the head leads, sometimes the hand, in making there is a fine balance to be struck between muscle memory and hand-eye coordination. Often as novice in many crafts, I find that the lack in muscle memory and coordination leads to the finished artifact being far from what I envisioned. This is where practice comes into play. Intentional practice, when done

right, allows the person practicing to interact with various aspects of this head and hand dance, building instinct, knowledge and foresight. So, while from the viewpoint of the outsider, practice appears to be repetitive, the person practicing is engaged in the mind, with the intention of smoothing out the aforementioned dance.

However, the opportunity and desire for such practice is diminishing in this age of digitization. The entertainment our digital devices offer distracts us and takes up our time. I often find myself watching videos of other makers rather than engaging in the act myself. Even now as I sit here and type, my fingers stumble over the keys, transcribing half thoughts. I wonder to myself, maybe it is better to write in my notebook, maybe if I am separated from my beloved 'backspace' key my thoughts will coalesce themselves better.

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2 What is an architect doing with leather?

To begin this conversation, I must state that for the most part, the central material that has been explored in this thesis in the form of artifacts is leather. But I specifically left leather out of the title of my thesis. Leather is the material of opportunity that I happened to come across in my undergraduate studies for the chair course. I had haphazardly stumbled into a material that is both rich in cultural and historical applications while still remaining relevant in the contemporary context. I count myself lucky in that way. Perhaps I could have explored the same topics that are covered in this thesis through another medium, wood or clay for example. However, I had already gained skills in leatherworking and through increasingly complex leather artifacts I felt that I could explore craft more thoroughly. This is not to say that other materials are inferior, in fact, the aforementioned materials make for better pontifications in architecture in my opinion. But we are not here to make things easy for ourselves. Here is the place for chasing dreams.

Leatherworking came into my sphere of fascination during my fourth year as an undergraduate student at Waterloo Architecture. A fellow student started playing around with leather as a hobby and I became enthralled by the material. The more I pondered on the material I came to realize so much of the things I interact with everyday are made of leather or the faux kind at least. Starting in my wardrobe I had a leather jacket that I prized above all other outerwear, a pair of pleather leggings, leather shoes, and of course, my purse and wallet was made of leather. When I took the chair course in 4B, the final term of my undergraduate schooling, I used it as an opportunity to dive into the craft. Equipped with just a couple of pricking irons and a plastic mallet I borrowed from the wood workshop, I started to make a nuisance of myself in the studio, hammering away at my leather while my classmates tried to work their designs for studio. Eventually I moved to the loft area and annoyed the master's students occupying the narrow studio next to the loft.

Leatherworking is a noisy craft, full of hammering and tapping away at tools until the final product is achieved. I recognize that I am lucky to live in a single detached house with my parents where I have free reign of the basement as my crafting space. Otherwise, living in an apartment would most definitely pose noise and space issues for my family and neighbours.

After graduation, I continued with my craft. It was a dark period in my life, and not just because of COVID, but for other reasons. Working with leather became a way to center myself again, a way to remain productive and regain a sense of self. It was therapeutic. On top of which, there was not much to do cooped up in the house during a pandemic.

When it came time to choose a thesis topic, I saw the opportunity to further my skills and knowledge base as a craftsperson while engaging in architectural discourse. Taking inspiration from my predecessors at Waterloo Architecture, who have engaged in this discourse through an abundance of mediums and artifacts from bicycles to canoes, to the dining table to clay, the list goes on. After all, the field of architecture should not just be narrowed to the scope of buildings but to a multitude of lens in which we can examine our environment as a whole. In fact the chair has practically become a cliché of the architectural world. Numerous architects famous or infamous have designed unique and often uncomfortable chairs. At this point it is a rite of passage. This tradition it has become one of the ways for architects to engage in the act of making again.

As I mentioned in the beginning, I left out the word leather in the title of my thesis because I feel that, although it is the dominant material, what is being discussed through these leather artifacts is more focused on craft and agency. I explore maintenance and repair, sourcing local and my own heritage in these artifacts. There is a brief chapter on wabi sabi, and themes of slow fashion, and slow living are sprinkled throughout. This is not a thesis on how leatherworking relates to architecture but a meditation on how, as an architect, the in-depth exploration of a material can open the conversation to a medley of topics that are crucial to the practicing of responsible architecture. But more importantly, I hope that this thesis can also represent a way of living that I would like to carry forward.



Figure 1 Wallet

3 The Wallet

I made a wallet before the start of my master's degree. Or rather I made many wallets and the last one that I made right before the start of classes I deemed fit to become an item that I carry around every day. An item of pride (fig. 1).

As I began my foray into leatherworking, the wallet was the first item I made. It was a basic build with minimal design and maximum usage. Or at least, that was what I had assumed. The process of making a wallet in my head was simple, but even in the simplest of designs there are many considerations. First, the leather I used for the initial wallet was meant for book binding and was far too thin. This meant the leather wrinkled and twisted around the waxed thread that I used (fig. 2).



Figure 2 The first wallet

A far cry from the sleek builds I had seen on social media. I acquired thicker leather and tried again, but this time the wallet still lacked rigidity despite not buckling under the force of the stitching. This was when I realized that I was using goat and calf leathers which were likely chrome tanned, all factors which resulted in leather softer in temper than the veg tanned cow leather that the leather crafters online were using. Thus, more leather was ordered, and I tried again.

Through this trial and error, I learned a lot about the characteristics of different leathers. Different animals yield different leathers, the tanning method is also a factor in the leather's temper (a term used for rigidity of the leather). For a more in-depth look at the biological composition of

leather and how it varies due to a difference in animal species and other factors, please refer to the appendix. A good grasp of all things leather related is key to efficiently using the material but also in understanding this thesis.

3.1 Beginning Leathercraft

Wallets are probably one of the first things a beginner leather crafter makes but is also an item that bears re-visiting once more proficiency in leatherworking is gained. The design is misleadingly basic, yet a well-designed wallet is also a classic. There are many finer details that the crafter needs to pay attention to if the goal is indeed to make a well-designed wallet that will last for years to come. For example, when stitching together the card pockets, I simply punched the holes for stitching in a straight line without consideration as to where each piece of leather overlapped. This resulted in holes landing on the edge of a piece of leather which essentially put a small rip in the edge. Over time and usage this minor misstep can lead to a faster deterioration of the wallet. This can be resolved very easily so long as there is foresight and planning. For my next wallet I measured the distance between each prong on my pricking iron and worked that into my design.

There is a term used in the world of boutique leather crafters, EDC, everyday carry. EDC implies the item in question, whether it be a wallet, pocketknife or coin, is a thing that someone values or needs enough for them to carry it around every day. This may seem obvious but there are implications to items that are carried around daily, a certain level of durability and quality. Mistakes like the one that I mentioned previously about the location of the stitching can make a big difference. There are expectations of the items in an EDC to last. Therefore, both on the maker's end and the customer's there is care for an item such as the wallet. At least that is what the hand-crafted leather goods community and its customers subscribe to.

This idea that items will last for a very long time is the antithesis of fast fashion and it is a growing trend. As more reports come in from around the world about the amount of waste that is generated by wasteful fashion trends, the conscious consumer is driven to ponder on their own consumption.

3.2 The expectation of touch

In my exploration of leather, I began to come across the word 'patina' at an increasing frequency. To put it simply, it is a characteristic change in colour of the leather over time due to use and wear. Our hands naturally produce oils which can transfer onto the leather, not to mention the grease and dirt that our hands encounter over the course of the day. Veg tanned leather shows this patina because of the more natural ingredients used in its tanning process. Whereas chrome tanned leather will maintain its 'look' throughout the lifespan of the product. Veg tanned leather, especially those that are not dyed, and left with a natural colour can really capture the life of an item such as the wallet.

This can be clearly seen in figure 3 where on the left is the wallet I made with natural veg tan leather in 2021 and on the right is some new natural veg tan that I just purchased for future projects. The darker spots on my wallet are where I may have accidentally scratched the leather or spilled a bit of liquid on it. Previously it would have been the cause of much heartache but now I have come to accept it as part of the process in which this wallet truly becomes mine. Each stain and scratch slightly discolours the wallet, adding to its naturally darkening patina.



Figure 3 Natural veg-tan after three years use vs. unused

3.3 Wabi Sabi

Learning to accept the daily wear and tear and to even look forward to the patina has also been a part of my learning curve with leatherworking. This mindset can also be found in the teaching of the Japanese philosophy wabi sabi. As defined by expert and advocate of natural living, Robyn Griggs Lawrence, wabi sabi has seven guiding principles; asymmetry, simplicity, austerity, naturalness, subtle profundity, freedom from worldly attachments and silence. More specifically wabi is ‘the joy of the little monk in his wind-torn robe’ and sabi is ‘the bloom of time’. The phrase, bloom of time, is not something found in western culture, but the passage/ passing of time is commonly used. When one compares the key words in these two phrases, passing and bloom, it is easy to see the difference in which each culture views time. One sees time to be slowly slipping away as passing is also commonly used in reference to death. The other, bloom, is associated with flowers, opportunity and springtime.

Through leathercraft and reading about wabi sabi I have learned to embrace the effects of time. To come to look forward to it even. The way I see the effect of patina as an architect, can be likened to weathering steel. There is expectation and excitement built into the design that accounts for time. It is my hope that in my future designs, time will be celebrated rather than grieved. Wabi sabi is a concept that is constant throughout this thesis.

---

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2. Ibid p 7

Figure 4 The roll top

4 The Bag

4.1 The Roll Top

This roll top backpack is one of the most complex leatherworking projects that I have undertaken to date. The overall design and pattern, I must confess, is courtesy of another leather craftsman, Tanner Claridge of Claridge Leather, who generously hands the pattern out for free (fig. 5). Due to my lack of understanding in bag design I decided not design my own backpack. Being a beginner leathercrafter, the daunting prospect of ordering so much leather already made me nervous. Up until this point I had only made smaller leather goods like coin purses, wallets and a tote bag which were much simpler in design than a backpack.

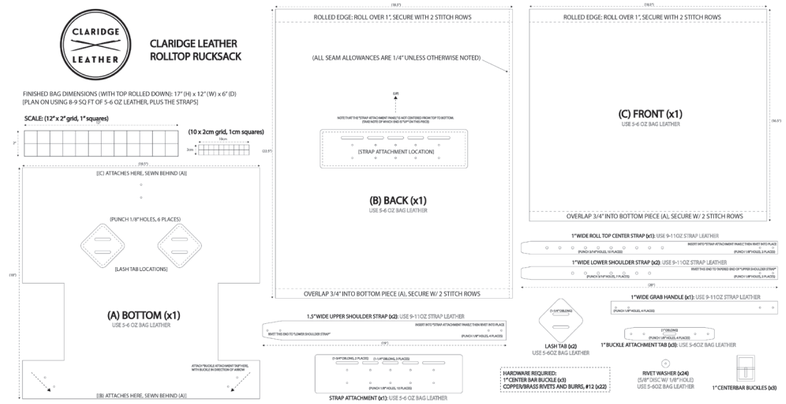


Figure 5 Tanner's pattern

By following someone else's pattern and exploring their design I began to learn about the correct proportions and dimensions for a backpack. Additionally, I also started to notice attachment styles of all my other bags as I began building the strap attachment for the roll top backpack. In my opinion, this was the best way to develop both my skills in leatherworking and bag design. If I had tackled the desire to make a bag from scratch by designing my own, I would have wasted valuable material in adjustments alone.

Although I have since found a good material to prototype bag as a stand in for leather. It is EVA rubber foam; this material is flexible and can hold its own shape, but most importantly it is cheaper than leather. I came across this material by chance on my Instagram feed when another leathercrafter used it to prototype a backpack. EVA stands for ethylene vinyl acetate.

Ordering the leather for this backpack was at the same time agonizing and rewarding. Agonizing because I was about to spend a couple hundred dollars on leather, which was going to be the most I had spent on leather, ever. Luckily, I found some leather from a supplier in Saskatchewan that what selling for around $5-6 per square foot which is a very good price point for top grain leather. The website of the supplier was very well organized and despite not being there in-person to feel and observe the leather, I was able to glean enough information from the video the owner shot to know that it was the right temper and thickness for my project. When the package arrived, I was pleasantly surprised by the colour and finish of one of the two different pieces of leather that I ordered. It had a suede-like finish that did not scratch easily. That was key because I had imagined the roll top backpack going through quite a bit of wear and tear.

Both pieces of leather I ordered from the supplier in Saskatchewan were sourced from the same tannery, S.B. Foot Tannery in Red Wing Minnesota. S.B. Foot was bought by the Red Wing Shoe company in 1986 and have since provided quality leather for their famous boots.[1] I would have liked to purchase my leather from the tannery because Minnesota is closer to Toronto than Saskatchewan, however the supplier in Saskatchewan has a wider selection than what the S.B. Foot website offers.

Then the time to make the bag came. I was nervous about cutting out the pattern because I had tiled the pattern on 8.5” by 11” paper when Tanner had suggested that cardstock as a better choice. Stiffer paper would have made it easier to the pattern onto the leather with an awl. My worries were for naught though, because I have come to realize in my leathercrafting that straight lines on the pattern do not necessarily translate to straight edges on the leather that is cut out. Especially when the leather I ordered is thicker than what I normally work with. I had to make multiple passes to cut through the leather and I find long straight edges particularly difficult to cut as I must apply pressure on the ruler over a greater distance. I did all my cutting of the large pieces on the floor of the basement in my parents’ house as my worktable there was not large enough to accommodate the

large half side of leather that I bought.

Tanner Claridge not only hands out his pattern for free, he also has a detailed video on YouTube teaching beginner leathercrafters, like myself, how to make the roll top backpack. It was very helpful, however, he was in possession of a leather sewing machine which I do not have.

Figure 6 shows the comparison of tools Tanner had in his disposal and my collection of tools corresponding to each step in the bag making process. One thing I must highlight is that the stills for each step are taken from Tanner’s YouTube tutorial (my hands are not that big).



Figure 6 Tanner’s process from YouTube

The hardware for the roll top backpack was bought from two vastly different suppliers. The copper rivets I ordered from AliExpress and the brass buckle, rectangular rings and sliding bar hardware I bought from Leather and Sewing Supply Depot in Toronto. My reasoning was that the copper rivets will most likely not change in quality regardless of where I get them and AliExpress offered a much lower price compared to Amazon or other leather supply stores. (AliExpress being the Chinese competitor of Amazon in third party online platforms) The delivery time was extended but I had ordered the rivets in the summer before starting my master's so there was time to wait. The other hardware was a different story. They were major visible components of the roll top backpack; the buckle was especially important because it served as the closure for the backpack and

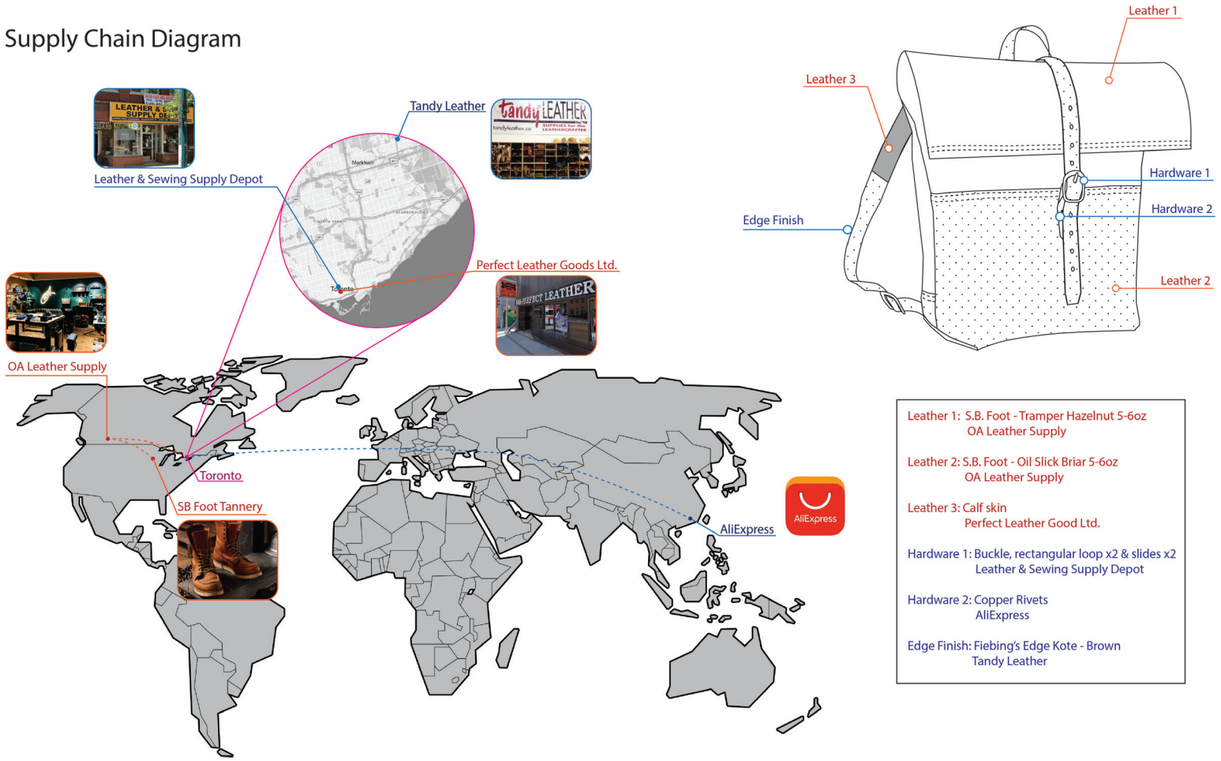


Figure 7 Material Sourcing

would be the first 'interface' that the user (me) would experience every time. That was why it was important that I picked out the hardware in person, so I could feel the weight and see the aesthetic of various metals and finishes of the hardware.

Brass out of all the other metal hardware selection stood out to me. I liked the antique finish which I thought would go well with the rugged look I was trying to achieve with the roll top backpack. Those were my only concerns when I had bought the hardware. Looking back perhaps I should have considered the environmental impacts of mining and the extraction of the metals that make up brass, copper and zinc. I can hypothesize and hope that the metals which were used to make the copper rivets and brass hardware were mined within the country of each supplier. However, I have no way of knowing exactly where the raw materials were extracted as the manufacturing process is likely to be influenced by the global economy and powers that be which operate beyond my understanding.

Figure 8 is a diagram of the strap attachment panel which is the most complex part of the assembly process. This diagram also illustrates one particular change which made the process of making the bag more time consuming for me. It was my decision to not purchase 10oz (about 4mm) leather straps, instead I sewed two 5-6oz (about 2mm) straps together.

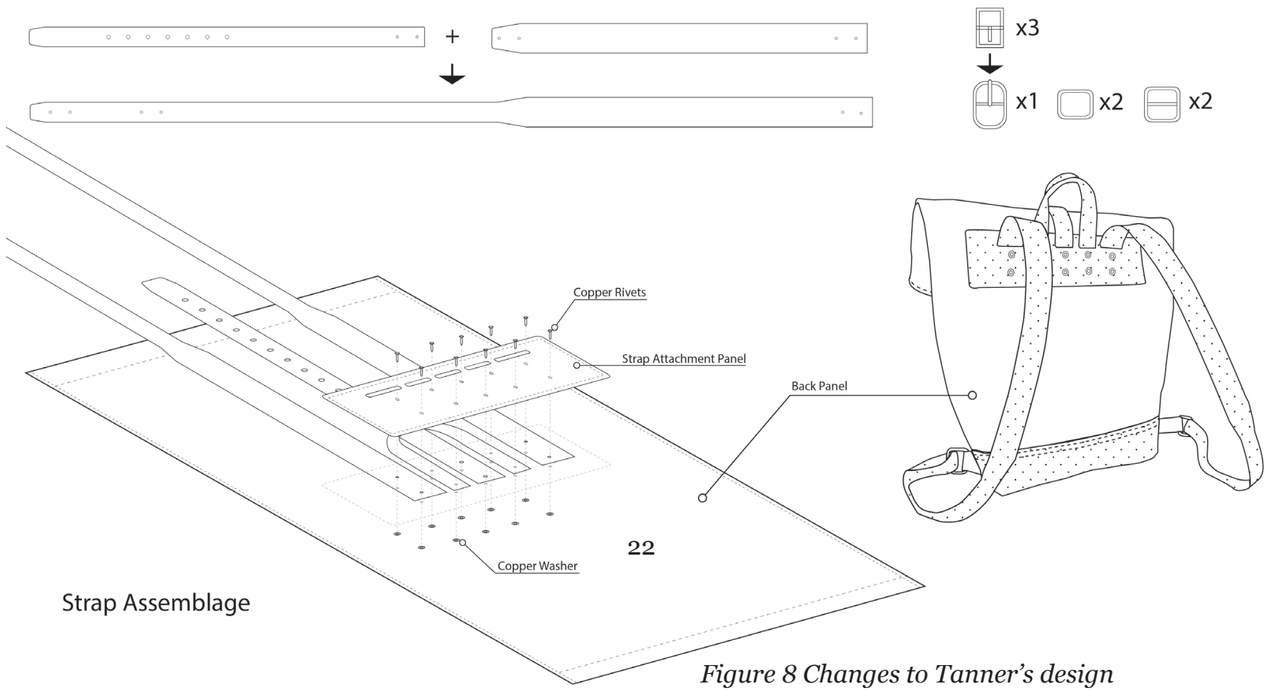


Figure 8 Changes to Tanner's design

The length of the strap meant that there was a lot of saddle stitching to be done. Especially when I extended the length from the original strap in order to accommodate another design alteration in the connection of the strap to the bottom of the bag. Through use I have noticed the center strap which closes the bag is used frequently bending to accommodate slipping in and out of the buckle. The motion has cracked the edge finish that I applied (fig. 9). Perhaps the edge should have been simply sealed off with wax rather than coated with this finish.



Figure 9 Cracked edge finish on the strap

Another aspect of the design that I would have changed in hindsight is the use of leather for the entire bag. The roll top backpack folds over onto itself to form the protective flap which secures the backpack and its contents. The use of leather for the top two pieces highlighted in figure 10 is excessive and can be replaced with another material like waxed canvas. This would also increase the backpack's capacity as the fully leather version makes it difficult to fold/roll down the flap when it is full.

Despite the changes that I would have liked to make, I have enjoyed using the roll top backpack. Whether it is to carry my notebook and laptop to and from school or my camera and clothes when travelling, this bag has



Figure 10 Redundant leather

held up remarkably well. I will admit that the bag may be a little over designed in the sense that the leather did not have to be that thick. But the thickness of the leather speaks to my desire for the roll top to be an artifact that I will continue to use over my lifetime. Though I will not be in constant need of carrying extremely heavy or rough materials such as bricks, the thickness of the straps and weathered brass hardware gives a sense of security. If I were to ever desire to carry bricks, the bag will not be the limiting factor, my back muscles will be.

4.1.1 Material Sourcing

In participating in the act of making the roll top I learned about bag design, material selection and leathercrafting techniques. After crafting the backpack, I began to take notice of the way that other bags are designed. Not only that, but I also became more aware of the materials needed to make a bag. The bag I made was a relatively simple design yet when I tried to trace the material origins of all the pieces, I could not answer for any of the materials that I used. I do not know the exact farm or cow that my leather came from nor which copper and zinc mine that the brass and copper hardware that I used come from. I do not even know where the fibers of the waxed thread that I used originate from.

Part of the problem lies on my part; I am of the nature to dive right in and ask questions later. In my excitement to create this roll top backpack, I overlooked the impact of my actions. Now, I cannot help but question the

carbon footprint left behind from my acquisition of all the materials as well as the extraction of the materials from nature. Part of the problem, however, I attribute to the double-edged sword of a globalized economy. I am able to order anything to my doorstep, allowing me to expand my crafting horizons and exceed the limitations of my locale. However, an unfortunate symptom of this is that individual towns and cities have rid themselves of facilities, which would have allowed for the production of local products. Lured by the offer of cheaper services and goods, it has erased the idea of sourcing local. An example of this is the closure of numerous tanneries in the Kitchener-Waterloo area formally known as Berlin.[2] Had the tanneries been open perhaps a wider selection of Canadian leathers would be available for leather crafters such as myself.

Although having access to Canadian made leather would have been nice there are several valid reasons for tanneries to close down in the Kitchener-Waterloo area. Purported to be using a by-product of the meat industry, the leather industry touts itself as performing a necessary function by keeping millions of tons of hides from landfills. However, the tanning process uses several caustic chemicals that are infamous for causing great harm to the natural environment and its workers. Tanneries are also well known for their odorous smells that be scented miles out. Lang Tannery, located at the heart of downtown Kitchener-Waterloo would have polluted the surrounding environment in more than one sense. Contemporary zoning by-laws would have done away with the tannery had it not gone out of business due to competition on several fronts.[3]

In trying to research the material origins of my roll top backpack I cannot help but wonder at the complex process in which it takes for a material to arrive at my doorstep. The simple design of the backpack does not compare to the complexities of architectural design. Yet when I compare the time I spend understanding all the materials that go into a building, it is minimal in contrast to how much I agonized over leather selection for my bag. In my limited experience in the profession of architecture I found that the material library of an office is often outdated, a mess or downright abandoned. As sustainable design takes the forefront in architecture, the topic of sourcing locally become an important aspect in the conversation of deconstruction and maintenance.

Design-build firms around the globe have been taking on this challenge. As experts emerge in deconstruction and maintenance, the importance of

an intimate knowledge of craft and material becomes apparent. I attended a guest lecture given by Co-adaptive, a Brooklyn based firm, that was a part of the lecture series at Waterloo Architecture. The most memorable takeaway from the lecture, in my opinion, was the fact that there is lumber in older buildings that are of a higher caliber than anything available in the market right now. This is because current lumber production is sped up artificially and there are regulations against cutting old growth that are in place now which did not exist at the time of construction for those older buildings. This highlights the importance of careful deconstruction and maintenance of older buildings. Developers that are under a tight schedule may overlook (purposefully or otherwise) the value of the timber in an old structure that has been marked to be taken down. This not only leads to waste added to landfills but is, at the end of the day, a tragic squandering of precious materials that could have been given a second life.

4.1.2 The Carrier Bag Theory

As I examine material origins in relation to my roll top backpack, I also begin to wonder about its design origins. Elizabeth Fisher hypothesizes in *Women's Creation* that the earliest cultural invention is a receptacle of some kind, a bag or sling to provide a way to carry more than what prehistoric people are able to hold with their hands.[4] When one examines the importance of this invention it becomes obvious the ramifications this has had on the survival and eventual spread of humans across the globe. From the humble carrier bag comes the ability to gather, carry and store food as well as tools, not to mention water. This allowed the prehistoric peoples to have the nomadic lifestyle that was key to survival before the invention of agriculture. Jump forward to contemporary culture, the bag has become more than a tool for survival but a cultural phenomenon that is often fetishized.

Ursula K. Le Guin provides an interesting perspective on the bag in her book *The Carrier Bag Theory of Fiction*. In it she proposes a world where rather than focusing on the 'hero' figure that comes back victorious after hunting with a spear, the stories are focused on the gatherer.[5] After all, most of the sustenance the prehistoric peoples consumed was gathered rather than hunted. Therefore, I posit the question; what would happen to history if the spear was not revered the way it was? What if history was not so focused on the killing of others but rather the development of culture? Instead of the ability to end lives being the empowerment that

it is, as a society we focused on empowering pacifist resolutions. Rather than the sharpness of the spear we emphasized the qualities of the bag, its lightness and durability. Is it possible that even the way we think about certain eras; the Stone Age, Bronze Age and Iron Age, be reframed? Could we replace stone with leather, bronze with straw and iron with cloth? Each material that I have named plays an equal if not more important role in the history of humanity. It is simply that stone, iron, and bronze happen to be materials resistant to decay.

As Ursula so aptly put, '(w)anting to be human too, I sought for evidence that I was; but if that's what it took, to make a weapon and kill with it, then evidently I was either extremely defective as a human, or not a human at all.'[6] Following this train of thought, by history's bashing and stabbing definition, I do not think any of us that have chosen architecture as a profession are very 'model' humans. Afterall, buildings are the biggest and most complex containers that humanity has invented to date.

4.2 The Crossbody Bag



Figure 11 The crossbody

The next receptacle that I designed and made is one that is inspired by need and fashion trends of late. I was first driven to design this bag when I applied and was fortunate enough to be selected by Waterloo School of Architecture for an internship with Renzo Piano Building Workshop in Genoa, Italy.

From my previous experience abroad, I found myself wanting a bag that was big enough to fit my sketchbook and shaped in such a way that it hugs the body, making it difficult for thieves and easy to move swiftly through crowds. And as the fanny pack recently made a comeback in the form of a crossbody bag, I thought this was the perfect opportunity to craft my own design.

To begin, I looked for precedents and inspiration from major brands. There were also patterns by boutique leather crafters online and luckily, I found a maker that, yet again, generously gave out their pattern for free. Unfortunately, while printing out the pattern and prototyping with paper, it became evident that this pattern was not large enough to fit the sketchbook I had in mind. At this time, I began to experiment with my own pattern, drawing it out roughly at half scale and prototyping with loose paper lying around.



Figure 12 Paper prototypes

During this iterative process I hit a snag. You see, as someone who is trained in the creative design process from an architecture school, my plan for crafting this crossbody bag involved a meticulously drafted template that was precisely measured out. Being a person easily thrown off track, the thought of having to restart my MacBook to access Rhino on the partitioned Bootcamp side presented as a big enough obstacle for me to put off making the crossbody for a couple of months. Looking back, it is comical to think that such a small thing as restarting my computer set the project back.

Eventually I had an epiphany, drafting a template was not the end goal, making the bag itself is what I wanted. I bypassed the drafting step completely and roughly sketched out the shape I had decided upon onto EVA foam and made another prototype (fig. 13).



Figure 13 Prototype with EVA foam at 1:1

After pinning the pieces together and trying it on for size I disassembled the foam prototype and used the pieces as a template. The design ended up being more fluid and organic through this process and while there are aspects I would like to improve upon, the final product is something I am happy with. The fit of the crossbody was snug and that was an essential part of the design I was attempting.

4.2.1 Forgoing Control

In this burst of creative energy, I came to realize that in leathercraft, as in all other crafts, the design that is drawn out is not always the final design. Changes as made along the way to improve upon the original idea. No matter how precisely the template is drawn and cut, in the end, how the



Figure 14 Laying out the EVA prototype as a template

pattern is traced out onto the leather, how the leather is cut, glued and sewn are all equally important in the process of making.

David Pye discusses this in *The Nature and Art of Workmanship*, he likens the workman to an interpreter. The design being the ideal blueprint that is supposed to be followed, but like a musical score, there is always room for interpretation. Good workmanship will interpret the design as the designer intended but bad workmanship will deviate.[7] Even when the designer and workman is one person, in this case me, I have found that the design is still constantly fluctuating even as the process reaches production. There are always aspects of the design that worked out perfectly in my mind but in practice it was lacking in some way or form. It was difficult to let go of the control I had when designing and cede to the process of making. But learning to go with the flow of the crafting process often resulted in finished products with pleasant, though unplanned, surprises. The creative process does not begin and end with the design, but rather in the process of making, opportunities will present themselves.

1. SB Foot Tanning Company. “History.” Accessed April 16, 2023. https://www.sbfoot.com/history.

2. “Lang Tanning | Doors Closed.” Accessed April 14, 2023. https://doorsclosedwaterloo.wordpress.com/lang-tannery/.

3. Ibid

4. Fisher, Elizabeth. *Woman’s Creation: Sexual Evolution and the Shaping of Society*. 1st ed. Garden City, N.Y: Anchor Press, 1979.

5. Guin, Ursula K Le. *The Carrier Bag Theory of Fiction*. Ignota, 1988.

6. Ibid p 32

7. Pye, David. *The Nature and Art of Workmanship*. Revised ed., Repr. London: Herbert Press, 2010.



Figure 15 The shoe

5 The Shoe

Shoes were always a challenge within leather craft that fascinated me as soon as I got into leatherworking. So many top-quality shoes and boots are made of leather. Footwear application is where the characteristics of leather come to shine. From breathability, to malleability, to its resistance to wear and tear, to its ability to come back to life with a bit of care, leather from millennia to now still plays an important role in footwear.

As this is also my first attempt at making shoes, I approached it similarly to how I approached bag making; by following someone else's design. In this case I found a kit that I thought was the best entry point to this esoteric craft. The kit, designed by Lonsdale Leather, a leather supplier in Vancouver, came with a pattern, insoles, rubber outer soles, laces, grommets and the leather that I would need for the body of the shoe and even a punching tool. The main reason I had ordered the deluxe kit was because it included the rotary punching tool (fig. 16) and the value of the individual parts within the kit was more expensive to obtain outside of the



Figure 16 Rotary punch

kit. Still, the kit was a hefty $170 after tax. I justified the purchase since the alternative was to fly out to Vancouver to attend one of the workshops that Lonsdale Leather was hosting, so by comparison, the kit was the cheaper option.

Diving to the crafting of the shoes from the kit I ordered; the pattern provided presented various options of the style of shoes I could make. The style ranged from low-rise to high-top. I chose the mid low rise one. It was at this point that one interesting feature of the pattern was brought to my attention. The pattern that was provided only included the upper of the left shoe and the position of the holes to be punched of the right shoe. This was perplexing at first but upon further thought, this saved paper as well as helped prevent a novice maker, like me, from tracing either a left or right shoe twice since the pattern had to be flipped to generate the alternate shoe. The crafting of the shoes went rather quickly and smoothly since I was advancing beyond a novice leather crafter at that point.

The one part I struggled with in the crafting process was lining up the holes that I had punched on the shoe upper with the ones that I punched

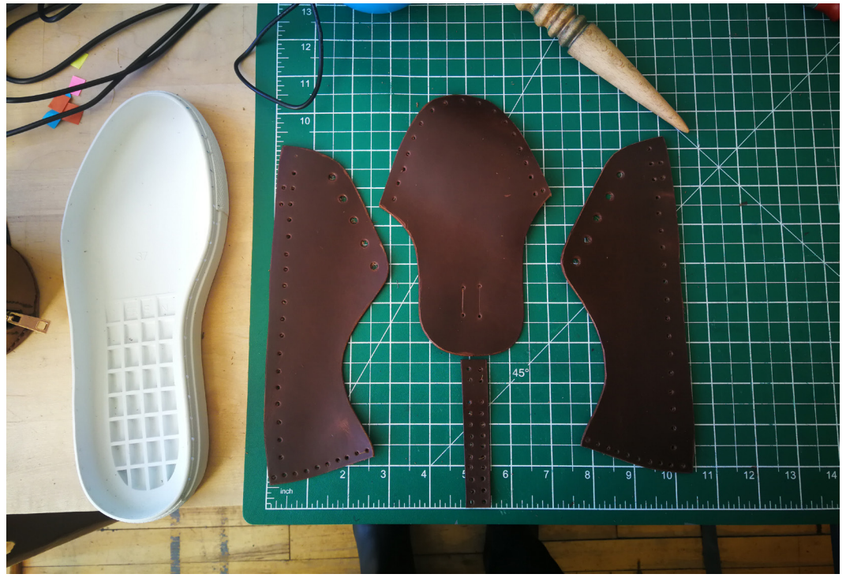


Figure 17 Shoe parts before assembly

in the outer rubber sole. This was especially difficult at the heel and toe areas of the shoe where that curvature was more extreme. The leather simply could not stretch in the way I needed it to, and this was a flaw due to the simplicity of the design. As I watched more shoemaking videos online, I saw that the leather for the uppers of boots and shoes were usually soaked in water overnight and then stretched over a shoe last to conform it to the necessary shape. A last s a plastic or wooden mold of a foot that can vary in size and even be made custom to an individual.

After making the shoe (and out of an instinctual architectural mindset) I drew a cross-section of it illustrating some if its design flaws (fig. 18). It was pointed out to me that perhaps the reason why this sneaker-like design did not work is because of the material I used, leather. Originally sneakers were designed with cloth in mind as the material, this way, the parts of the shoe that were uncomfortable would be lessened due to the softer and flexible nature of cloth in comparison to leather. This is not to say that leather is not a good material for shoes, just that this design specifically should not be paired with leather.

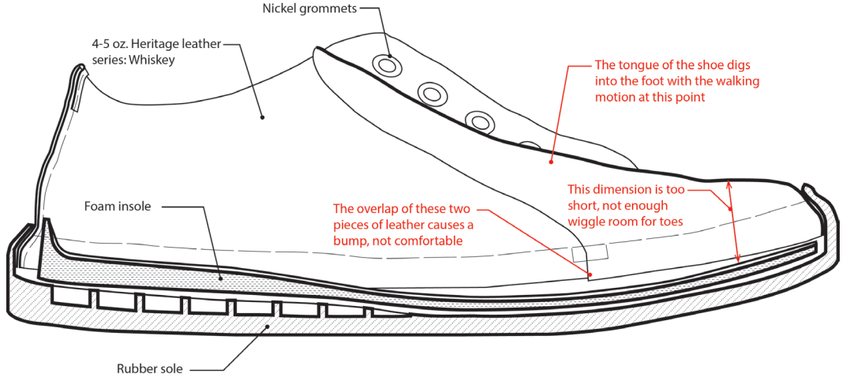


Figure 18 Uncomfortable parts of the shoe

Although the shoe was not comfortable, the kit allowed me to learn more about the shapes which compose a shoe upper. Thereby demystifying the shoe making process, just a little. As I became more interested in footwear, I became aware of a brand based in the U.S. called Nick's Handmade Boots. Mesmerized by their diligence and crafting process I decided to

make a section of pair of boots by Nick's Handmade Boots (fig. 20).[1] The number of components within just the sole of the boots themselves outnumber the total number of components it takes to make the shoe from the kit I ordered. This boot is a much better example of how leather is a superior material in the shoe industry. The front part (vamp) of the boot is wet molded to a shoe last. This process uses the elasticity of leather when it is wet to form it into the most comfortable shape possible. In contrast to the simple flat pattern from Lonsdale Leather, the three dimensionality that is attained through the wet molding technique is crucial to a comfortable shoe.

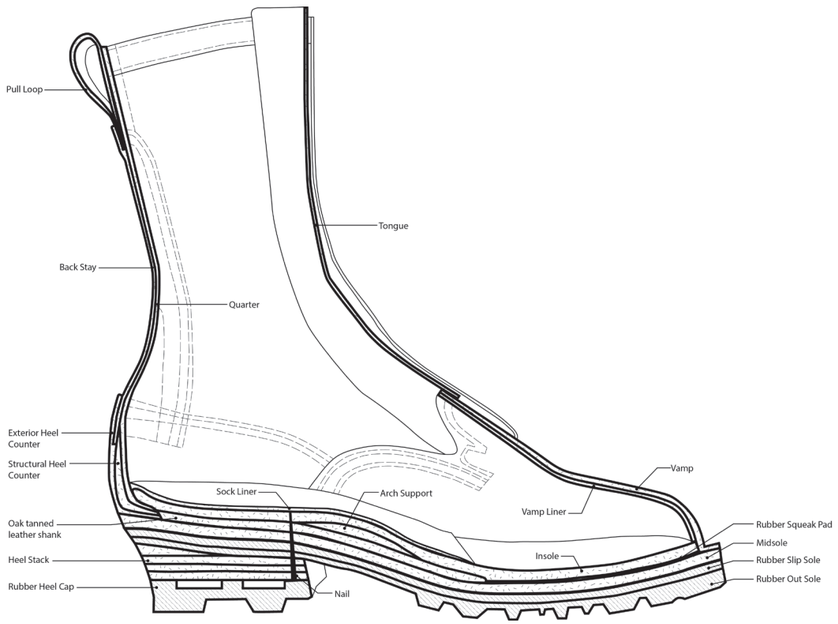


Figure 19 Cross-section of a Nick's boot

The level of complex craftsmanship that is put into constructing that boot can be starkly contrasted to the simple shoe that I had made through the two shoe sections. Clearly, if I want to make a comfortable shoe, I still have a long way to go.

5.1 Tools

> "A tool is an extension of a hand. My tools are an extension of my hands. A rusted tool cleaned and repurposed becomes an extension of a hand new to its use. Our hands have grown with tool use, are now as if always designed for it. The tapping of my fingers here – a shorthand for their potential. I look at my hand and know they are not hands alone, know their potential rests within the articulation of the body they are attached to."
>
> - Nick Kary, *Material*[2]

If I were a person prone to making excuses, I would lament the lack of proper machinery to be the main cause of the uncomfortable shoes that I made. Unfortunately, that is not the case. A content creator going by the name Corter Leather on YouTube put this very aptly. I am summarizing his words, but the idea is that machinery should aid a craftsperson but should never be able to replace them. The reason to purchase a new machine/tool should be to optimize workflow and keep up with incoming orders, never to shirk a skill that is difficult to learn. With minimal tools one should be able to accomplish even the most complicated projects. To learn the craft of anything, even something as complex as shoe making, the cost of tools should never be the main deterrent.[3]

Let us put this another way, if the people of medieval times were wearing shoes it means there must have been a way to craft shoes without a sewing machine or a specialized cutter that trims excess rubber soles. The modern craftsperson must learn to be discerning when it comes to purchasing tools for their craft. Too often, and I speak from experience, there seems to be a new and fancier tool that accomplishes a task faster or better. Or even worse, there are tutorial videos that are sponsored by the very company that produces new and fancy tools in which a content creator will swear by. Despite the positive side to social media that has connected communities and given a voice to the repressed, there are the negative effects of rampant consumerism and false advertising.

I have cataloged all the tools I have acquired for leather working in figure 20 (on the next spread). To be honest, this collection is about 5 years in the making as I started leatherworking during my undergraduate years.


1 prong pricking iron


2 prong pricking iron


6 prong pricking iron


1/8” hole punch


6mm hole punch


17mm hole punch


skiving knife


no.3 edge beveler


skiving tool



diamond awl


scratch awl


rotary punch


maul


wing divider


wooden edge slicker


eyelet setter

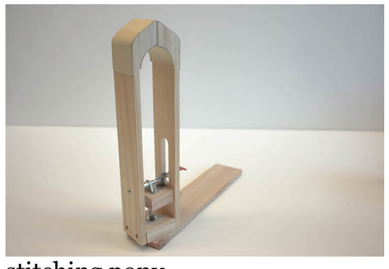

needles


plastic chopping board


paddle strop


edge finish applicator


rivet setter


stitching pony


lighter

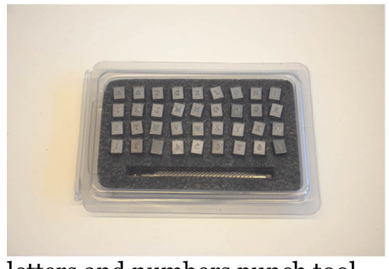

letters and numbers punch tool

Figure 20 Tools

To those interested in starting leatherworking this may present as a hefty investment and one that is difficult to justify. But realistically on a third of the tools are used on a daily basis. All the other tools are nice to have and there are moments where they are useful but at the end of the day most of these are frivolous purchases that I would not have made had I the knowledge I have today.

Tools should always be an extension of the hand of the craftsperson. Well-cared for and sharp tools are the safest and most reliable. This may seem antithetical to safety as sharper tools can pierce the skin easier, but a blunt and rusted tool will be much more dangerous because this will cause the user to apply more force and be in less control.

> "As my fingers hold the blade, I sharpen, twist it in the light, my forearm facilitates the pivoting of my hand and of the tool to catch light. As I lift it further my shoulder flexes, the muscles contracting, the potential of my hand rippling through my upper body. I manipulate the tool, my manus holds it and the action I practice facilitates the life force of the tool. I, a human, manipulate my destiny through my interaction with my surroundings, and tools allow me to do this potently."
>
> - Nick Kary, *Material*[4]

As a budding craftsperson, I am beginning to see the value of good tools. Perhaps this Japanese skiving knife from OA Leather, fig 21, costs $175 but in return this knife can last for many decades. If cared for through vigilant



Figure 21 Japanese skiving knife

sharpening and stropping, the knife's edge will remain just as sharp as the day it arrived. I have a cheaper version from Amazon currently that was about $20, the metal of the blade is not the same but with some extra effort it still gets the job done. As I mature in leathercrafting I try to be more conscientious of the tools I buy. I ask myself, 'Will I still be using this tool in ten years? Can it last till then?'.

After all, a craftsperson's tools are an extension of the person themselves. What they make begins and ends with the quality of their tools. Each craftsperson has their own specific set of tools in which they are able to create things that, first and foremost, bring them joy. A craftsperson's tool set is unique to every individual. I am familiar with the peculiarities of my own tools and their storage as well as placement in my workspace is an organized chaos that only makes sense to me. Tools are a medium that allows each craftsperson a sense of control over their world, empowering them through the act of making.

5.2 Maintenance and Repair: A Meditation on Care

> "Our word 'maintain' comes from the Latin manu meaning 'with the hand', and tenere, 'to hold'. To maintain is to hold with your hand, to be present in the moment, as the French for 'now', maintenant, testifies. It suggests 'habitual practice', a continuum of care necessary to keep ourselves and the objects we create from slipping into the wild unkempt."
>
> - Nick Kary, *Material*[5]

When it comes to maintenance, less care is given to shoes along with a multitude of other articles of clothing which have become replaceable and easily discarded in this era of fast fashion and consumerism. Though there are still cobblers an seamstresses, they are becoming obsolete as more and more people opt to update their wardrobe by throwing things away. As a result, manufacturers are using increasingly cheap, short-lived materials that have longer lasting impacts on the environment.

But where does this lack of care stem from? Is it from the constant barrage of ads and societal pressure to keep up with current trends and fashion or the fact that people simply have less time in their lives to tend to the things that are supposed to be held dear? This modern idea of constant

growth that is ‘supposed’ to occur in our lives is unrealistic. The capitalistic drive to produce more, earn more and spend more is detrimental in more ways than one. With Earth’s finite resources, this is no longer a viable way of thinking and yet this philosophy of productivity has permeated our society so deeply that there are real mental health related consequences in response to this pressure.

A response to this pressure is the resurgence of vintage or second-hand stores and local markets with communities. As well as a renewed interest in handmade objects such as shoes. Small operations such as Nick’s Handmade Boots in Spokane, Washington are rising in popularity because there are people disenchanted with fast fashion and rabid consumerism. Despite these boutique items being more expensive than their conglomerate counterparts, there is still a market for them. The idea is that these items, such as the boots from Nick’s, are built with quality and are meant to last. Nick’s Handmade Boots also leans into these ideals by offering a sole repair program that one can subscribe to. Often it is the rubber sole that wears out before the leather of the shoe upper, so instead of throwing away perfectly good leather shoe uppers, which are molded to the shape of the individual’s feet, there is the option to renew just the soles.

Although I must admit that even rabid consumerism has had its moments where it has come full circle. Some sneakers are so expensive now that there are those who collect limited editions from various big brands. This has spurred on an industry of sneaker repair that can be called tangential to cobblers. So, despite the tragedy of the traditional cobbler, the modern counterpart, for the lack of a better name, sneaker repair, has flourished.

I do see the attraction of buying new and shiny things once in a while but in my opinion, there is an even greater joy in having a well worn thing such as a pair of boots that have been by my side, or rather on my feet, repaired and renewed to their former glory. After all I have a pair of hiking shoes from 2018 that has travelled the world with me and the day that those shoes give out will be a sad day for me indeed. Hand-me-downs are looked down upon by society and mainstream culture but perhaps that is because the quality of the items being passed down has deteriorated. When an old leather jacket or knobby sweater or a silk scarf that used to be owned by grandpa or grandma gets passed down, there is a sentimental value attached to such items. Because this well-made item has lasted so

long, it is also well-loved. The item’s value is not simply in the quality of material but in the memories associated as well. In turn there is a desire to repair or maintain that item because of its immaterial value. This is what fast fashion loses out on. This is also the strategy that many big brands try to tap into despite the absence of their commitment to make a lasting product. With rivers in Ghana literally drowning in discarded clothing from the devastating effects of fast fashion, it is time to reconsider our buying habits.

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1. “Nicks Handmade Boots: Anatomy of a Boot”, 2018. https://www.youtube.com/watch?v=z7fMov4TH1s.

2. Kary, Nick. *Material: Making and the Art of Transformation*. White River Junction, Vermont: Chelsea Green Publishing, 2020. p 153

3. ADVANCED Leather Crafting Tips and Tricks!, 2022. https://www.youtube.com/watch?v=jZkLydH49xM.

4. Ibid

5. Ibid

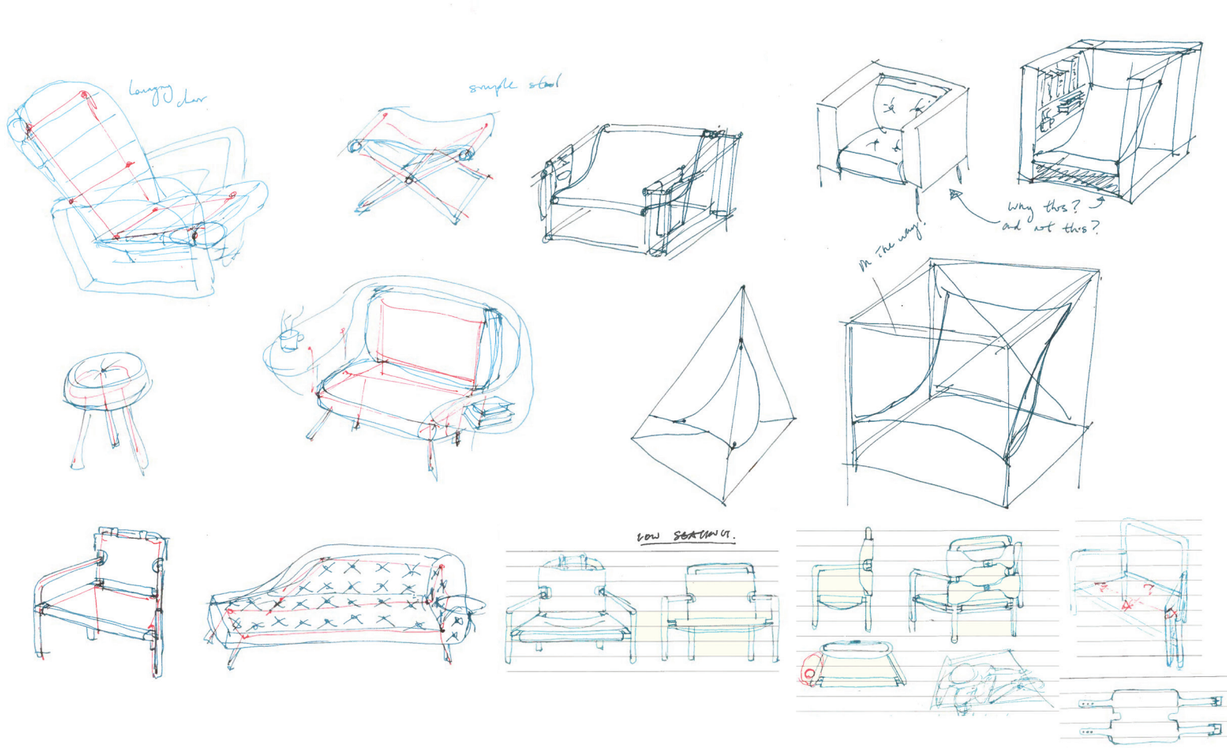


Figure 22 Initial Sketches

6 The Chair

This artifact needs no introduction. As I mentioned in the second chapter, the chair appears to be the one piece of furniture that all architects have an opinion and a design. Having experience in making a chair because of the chair course I took in 4B I decided to design my own. For this artifact I wanted to emphasize the qualities of leather, mainly its durability, flexibility, and texture.

Though this thesis is focused on leather as a material, as a whole it is exploring agency through craft, hence the title. So while it may be novel to explore design options where leather replaces all the structural components of the chair it is not the goal of the thesis to prove that leather is an all-encompassing material. Where wood should be used, it will be. Structurally speaking leather is good in tension but not compression because it will easily buckle. As a craftsperson I strive to use the appropriate materials and play to the strengths of each rather than trying to re-enforce a weakness. This is the mark of a craftsperson that knows the limits of the materials they are working with and fully takes advantage of their arsenal. Likewise in architecture, appropriate uses of material in the right situations can produce remarkable and well-designed buildings even within a tight budget.

With that said, I do attempt to make a chair that structurally uses only leather later in this chapter.

6.1 Out of Scale

The first design I decided to focus on is the one where a large piece of leather is suspended on a wooden frame, with a smaller piece of leather which provides a nook to hold books. This design is the one I went forward with because it offers the opportunity to also explore wood joinery techniques. After conversations with Michael Sims and Heinz Koller from the wood workshop I decided to build a rough 1:1 prototype before diving in depth into the joints. For the prototype I decided to use canvas instead of leather due to expenses. Additionally, the wood I used is dimensional lumber, which is usually a softwood, likely pine. Instead of spending time on joints I used screws to attach the members together. The goal was not to work on my fine woodworking skills but to capture the overall look and feel of the chair at 1:1. I found the canvas to be much more flexible than



Figure 23 1:1 Prototype featuring my friend Chi

leather so there are some design considerations to keep in mind for the final iteration.

The dimensions of the prototype were not quite right (the understatement of the year). I had thought that after a brief perusal of Human Dimension and Interior Space: A Source Book of Design Reference Standards by Julius Panero,[1] that I had a good grasp of how big a chair should be. I



Figure 24 First chair model at 1:10

was gravely mistaken. I had built a model of the chair I wanted to build at 1:10 (fig. 24), but I failed to communicate the scale of my model in my discussions with Heinz and Micheal.

Typically, furniture prototyping is done at 1:5 so they had assumed the chair model I built was at 1:5 and the unfortunate thing is that it looked proportionally right if it was indeed what I intended. This miscalculation had gone overlooked until I had cut out all the members for my chair out of rough dimensional lumber for the prototype. That afternoon I had a good laugh at myself in the wood workshop and then proceeded to reduce the length of each member by about 60%. The following image shows a side-by-side comparison of the chair I had planned to build in

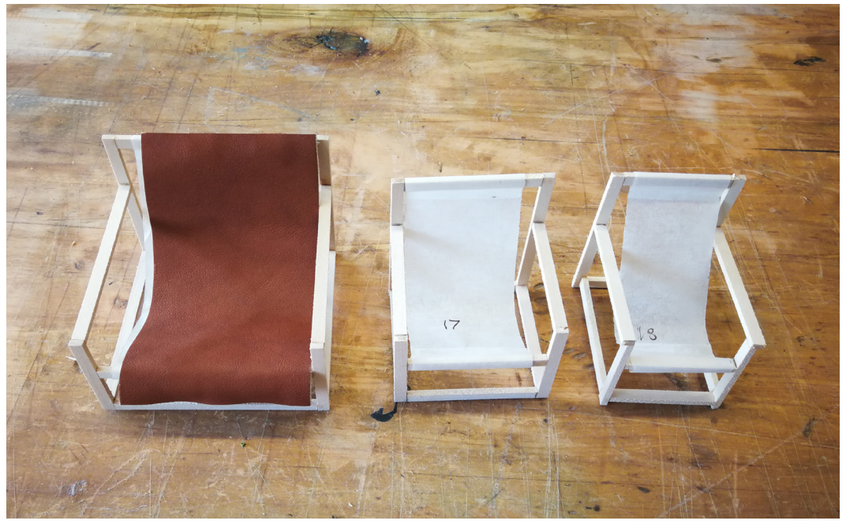


Figure 25 All three 1:10 models next to each other

the beginning with the one that was built, figure 25. The third chair in the image, on the right, is another model I had built after the construction of the 1:1 prototype. I was not satisfied with the proportions of the first chair, even after the modifications to fit a typical human.

I had wanted to construct a second iteration of the prototype at 1:1 before I bought hardwood for the final iteration. However, inspiration has dragged my attention to another artifact in the following chapter that will replace the chair as the finale for this thesis. Thus, we will just have to settle for

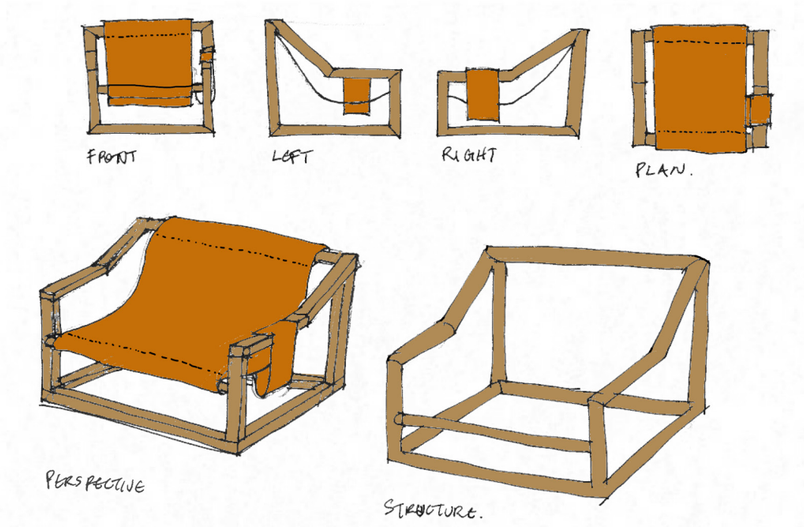


Figure 26 Coloured sketches of the design

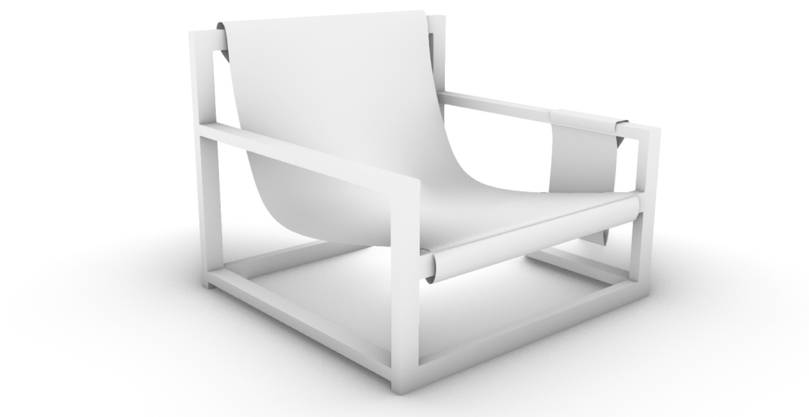


Figure 27 Rhino model screenshot

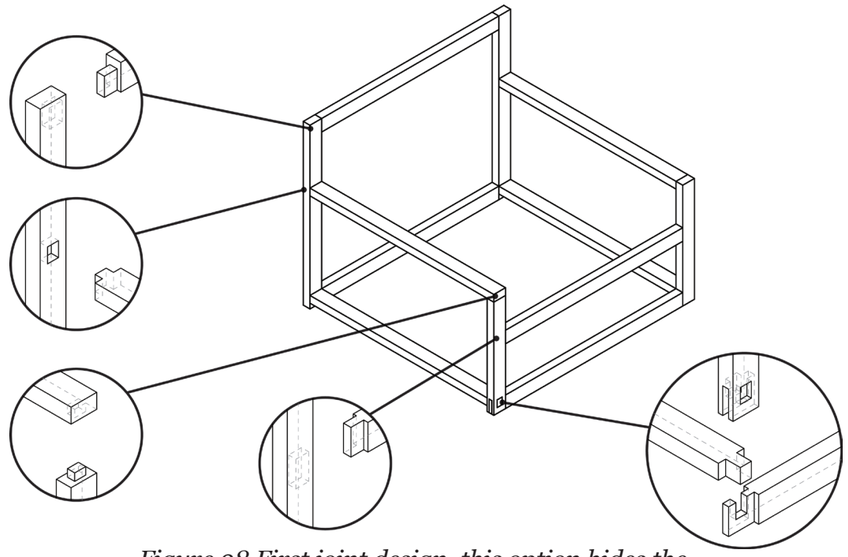


Figure 28 First joint design, this option hides the connection, but may result in a weaker connection

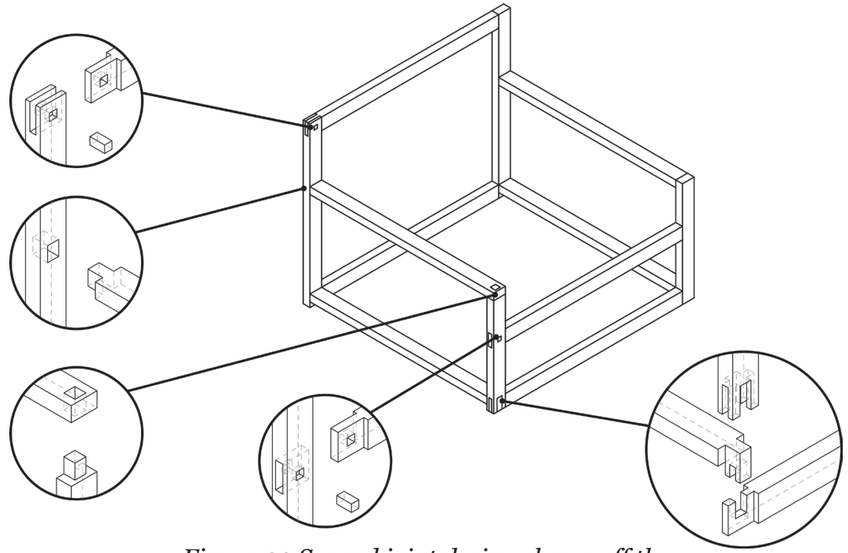


Figure 29 Second joint design shows off the connection, celebrating the craftsmanship

some drawings I had done to work out the design of the chair joints in figures 26-29. For the final chair I wanted to use joints comprised of only wood. This had two benefits, since I am already using wood, I did not want to introduce another material (like metal screws) to the design of the chair and fine woodworking has always been a passion of mine. Although this design was not realized, my fine woodworking skills will be put to the test in the next chapter.

This is also the reason for the brevity of this chapter. Initially I decided to design a chair as the one crowning artifact that marked the completion of my thesis. Following in the footsteps of many famous architects I fantasized about creating a chair that would be named after me. However, I hit a slump in the design process shortly after,I was overwhelmed by multitude of chair designs already out there. As much as I tried, I felt no connection to the chair I was designing. As a last-ditch attempt, I wanted to indulge myself. I decided to try designing a chair wholly out of leather, without the structural support of wood or metals. From the beginning I knew it was not a project that held a lot of promise. While leather is great in tension, it tends to buckle quite easily in compression. So therefore, let us keep in mind that this is most definitely not using the material well as we go onto the next section.

6.2 Testing Material Limitations



Figure 30 A leather stool

Before I even started designing, I had found an interesting design of a folding stool on Temu(fig. 31 on next page). Temu is a Chinese equivalent to Amazon. Although Temu used plastic I felt that I could achieve a similar effect with leather. Since I had already spent an inordinate amount of money on a very thick piece of veg-tanned leather for my previous chair design that I would not be using any time soon, I decided to give into the ridiculous urge to completely rely on leather for structure.

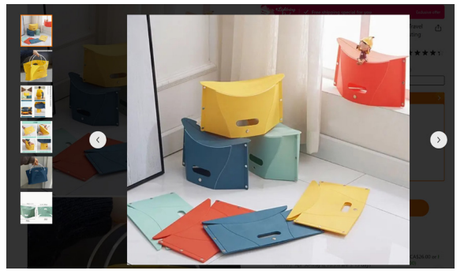


Figure 31 Folding stool being sold on Temu

Of course I made a prototype at 1:1 to begin(fig 32). The foam core I used for the prototype was stiffer than the leather I had so it held up under the test of my weight. This was not an indication of how the leather would perform, still I held out hope. I was relying on the fact that it was a stool in which the decreased height would give the leather a better fighting chance in compression. I was almost right, or rather, the finished stool still held under my weight, but I could feel the slow buckling of the leather in real time the longer I sat on the stool.



Figure 32 Prototype out of foamcore

Upon further examination of my Temu inspired design, there are a few areas to be improved. First the seams of the stool are connected by a nylon strap which is secured by brass rivets to the leather. This was a mistake, the nylon strap is redundant. If I had simply sewn or riveted the sides together, the seam would not be splitting the way is it in figure 33. Second, the leather I used for the stool is by no means the thickest leather that



Figure 33 Seams slowly splitting and leather buckling

is available. This leather was originally intended for the previous chair design where the main structural concern was tension. There is thicker leather available that would have been more appropriate for the stool, the kind that is used in saddle making comes to mind.

This was an interesting exercise in that, I took advantage of the thickness of the leather by cutting V-shaped channels along where I wanted the leather to bend. And the aesthetic is pleasing enough, but now I wonder if it would be possible for this stool to double as a bag somehow. In my desire for this piece of leather to remain useful I am torn between removing the rivets and reinforcing the seams or finding another function in the geometry. The size lends itself nicely to a large handbag or carrier bag of some sorts. I have included a vision of the design in the sketch on the next page. Despite my desires to explore this further, time is of the essence and I have definitively not left enough for the next artifact.



Figure 34 Sketch

1. Panero, Julius, and Martin Zelnik. *Human Dimension & Interior Space: A Source Book of Design Reference Standards*. New York: Whitney Library of Design, 1979.



Figure 35 The screen

7 The Screen

In the middle of my master's degree, I applied to an internship opportunity at Renzo Piano that was offered through the school. I was fortunate enough to be chosen for the position, and I was off to Italy for 6 months in 2023. While I was in Italy I visited Milan multiple times, and I caught an exhibit on folding screens on display at the Prada Foundation. There I was inspired by the cross-sectional display of folding screens that spanned history, art and culture. It was also on that trip that I decided to include a folding screen with panels carved out of leather as an artifact in my thesis.

Being of Chinese descent and having immigrated to Canada with my parents when I was 4, I always felt the need for a deeper connection to my cultural roots. This artifact provided me with the perfect opportunity to dive into a design that was culturally significant to me. With the added benefit of being a temporal architectural element with a varied cultural precedence, a folding screen (in my opinion) was the perfect way to finish my thesis.

This ingenious piece of furniture had many purposes in ancient Chinese homes, such as blocking wind and sectioning off a space for privacy. The idea of the screen blocking wind may seem curious as cross-ventilation is always a good thing, but it was thought of as unlucky for there to be too much of a cross breeze as it will carry out all the luck in a space. Thus, the folding screen is usually placed in front of an entrance to decrease the amount of air flow entering a space. The placement of screens had an auspicious purpose on top of the practicality of stopping the wind from blowing papers or worse, embers around the space being inhabited.

Folding screens are also artifacts of romance and sensuality because they are often associated with the image of a young lady or courtesan changing their clothes behind it. Since some screens were made from a combination of silk panels and a wood frame, this creates a translucent separation between the individual changing and rest of the room, offering those in front of the screen a silhouette of the person behind. Tension and anticipation are easily generated in such a moment, as one can imagine (fig. 36).



Figure 36 AI assisted image

Building upon that sentiment, I wanted the folding screen that I designed to offer glimpses of the other side of the partition. As a piece of furniture that functions as a moveable wall, the idea of the folding screen enticed me because it transformed an impermeable and permanent element such as a wall into one of permeability and temporality. I considered using raw hide, which is animal skin/hide that is petrified but have yet to go through the tanning process, for its translucency. In the end, I decided against the material because it is hard to manipulate when it is dry, and I was unsure whether it would be able to take tooling marks well. Leather tooling is when the leather is dampened then cut and stamped with tools of various textures to create an image or pattern. I wanted to etch a pattern on the leather, so I decided to use natural veg-tan instead of raw hide. And instead of allowing the silhouette to show through translucency, I designed a folding screen with purposeful gaps in each panel which allow glimpses of what, or whom, is being concealed.

Folding screens may have started out as a piece of furniture that divided spaces however, it has since transformed into sculptural art, the panels providing the perfect canvas. There have long been scenes of palace life,

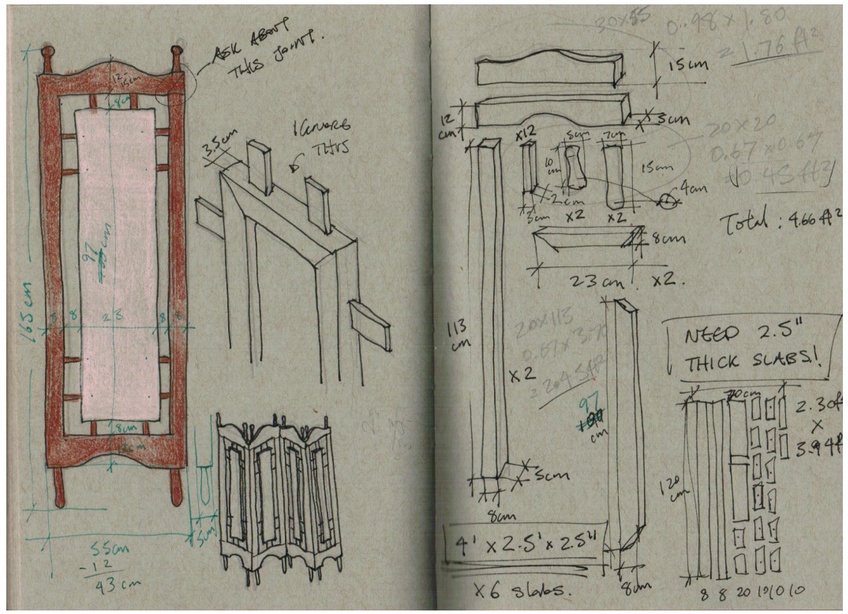


Figure 37 Scans from my sketchbook

nature, mythical stories and intricate patterns carved or painted onto ancient Chinese screens. To add another layer of meaning and depth to the artifact I am making, I decided to carve the Chinese zodiac animals of my family members onto the screen. My immediate family will be on one side of the screen while the three zodiacs of my grandparents will be on the other side. There are only three because a zodiac is repeated in the pairs of grandparents. The folding screen has four frames and 8 panels in total because in each frame, I wanted two leather panels to sit back-to-back thereby hiding the backside of the leather. As there is often no distinguishing between the front and back of folding screens, I wanted both sides of each frame to contain an image.



Figure 38 Zodiac sketches

7.1 Wood Selection

Initially I had wanted to use walnut. I thought the darker hardwood would contrast nicely with the light natural veg tan colour. Walnut is also a species of tree that is native to North America. This was why the price of walnut surprised me when I when to peruse the website of A&M Wood Specialty, a store selling lumber of various kinds that is located in Cambridge. After talking with several people in the wholesale lumber business I accepted the fact that walnut had increased in popularity recently and was now out of my budget.

My next choice of wood, sapele, was cheaper by $4 per board foot at $8-9 depending on the cut. For the amount of wood I need for this artifact, using walnut would have made it $150 more expensive. In my conversation with Heinz Koller about my wood choices, he mentioned that the window sill details of 7 Melville St S, the very building of Waterloo Architecture, uses sapele. Coincidentally I had also used sapele for a site model in one of my undergraduate design studios. I liked the rich brown of sapele, and I thought it echoed the warmth of the beige of the natural veg tan leather panels.

It is curious that an African hardwood such as sapele is less expensive than domestic walnut. Had I more resources at my disposal, walnut would have been used.

7.2 Skill

In my excitement over the folding screen, I grossly overestimated my woodworking skills. Although I had taken both the introduction to woodworking and optional chair course, a long time has passed since. On top of that, there are many skills and a knowledge base in fine woodworking that takes years to build. Having no such time at hand, the final artifact I present is something that is to the best of my abilities and most definitely can be improved upon.

Building upon my experience with the chair I knew it was a good idea to make a 1:1 prototype after making a rough 1:10. The prototype not only to ensure that my dimensions were proportionate but also to work through the joinery and assembly so that I can practice each step before starting on the sapele that I bought. Additionally making a 1:1 prototype gave me a

good estimate as to how long it would take to build each frame. Of course, it was slower the first time, which is to be expected, but it was a good benchmark.



Figure 39 Left image is 1:10 model and right image is 1:1 prototype

It is with this benchmark in mind that I must confess that the folding screen will not be completed as per my design for the conclusion of this thesis. Out of the four frames I hoped to craft, only one will be complete by the time this document is sent out for review. Figure 40 is an altered image using one frame, photographed at different angles and Photoshopped together to give an idea of the final design.

There were many aspects of the folding screen to test out, excluding the 1:1 prototype out of pine, I also needed to practice tooling leather. The process was foreign and intimidating, figure 41 shows my first attempt at tooling on a piece of burgundy veg-tan leather by Wickett and Craig. There are places where I hit the stamping tool too hard and made a deeper than desired mark on the leather. With tooling, a delicate use of force is needed



Figure 40 Vision of final design



Figure 41 First attempt tooling leather

to make an impression on the leather, and it is markedly less than the force used to punch stitching lines through leather. I factored my lack in skill with leather tooling by drawing the Chinese zodiacs in a more stylized manner. I took inspiration from the patterning and shapes of traditional Chinese cut paper art. The simpler sillhouettes proved to be easier to replicate onto leather

David Pye dismisses the word skill as a term that is a 'thought-preventer' because of the vagueness of the word in *The Nature and Art of Workmanship*.[1] I agree that it can mean vastly different things to different people, for example to be skillful as a pianist or a carpenter, two very different skillsets are needed. The problem is that I find myself at a loss for a better word to describe my efforts. If I am not honing my skills in



Figure 42 Practicing mortise and tenon

woodworking and leather working in the process of my thesis, then what am I doing? I think there is more behind the word skill than Pye gives credit to. Take my attempts at hand carving the mortise and tenon joints. The goal is to chisel out the wood for a mortise and tenon joint, but it takes practice to know how hard to hit the chisel with the mallet, what angle to push the chisel so that you take off the right amount of wood. Chiseling across the grain versus with the grain is also different, with the grain will result in nice curls of wood and leaves the surface you are chiseling smooth but across the grain will result in rude splinters. Sometimes if too much force is used, wood that you do not want to fall off will fall off. Nothing is more heartbreaking or infuriating when that happens. It is fair to say that I am more skillful with the chisel now than I was at the beginning of this thesis. Pye equates skill with knowledge[2] but in my experience, there is something more tacit to skill than what knowledge encapsulates. In skill, there is also instinct, and muscle memory built upon hours of practice, all of which adds to the adeptness required to be called skillful. Perhaps I can agree that skill as a word is a 'thought-preventer' in that the daunting

amount of work required to become skillful often dissuades those that are half-hearted in their aspirations. Skill is not easily acquired.

7.2 Handmade

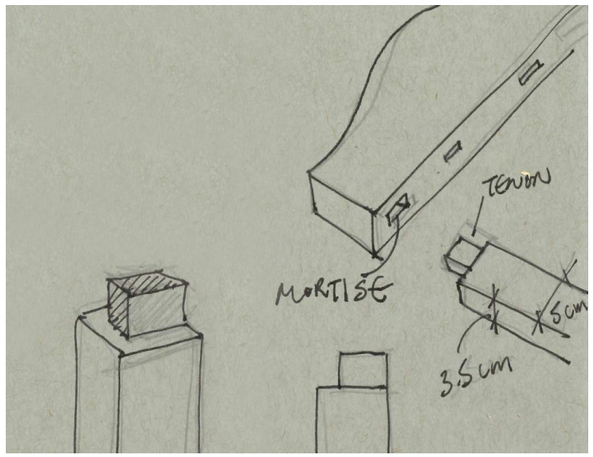


Figure 43 Mortise and tenon diagram

My decision to hand carve the mortise and tenon joinery stems from a need for greater control and a lack of knowledge. This may seem counter intuitive but let me explain, firstly, there are other joints that can be done on the table saw which would greatly speed up the process. I simply do not like the aesthetic of those other joints. Second there are probably machines out there that can make a square mortise joint, but my lack of knowledge and skill in utilizing these machines would have resulted in sloppy mortise joints and required much practice anyways. I made a judgement call and decided that if there were steep learning curves either way, that I wanted to learn the skills that I could use in the future. Since any piece of machinery could cost thousands of dollars and the likelihood of me purchasing even a few is next to nil, the chances are higher that I will be using hand tools, chisels, in the future if I were to continue with woodworking on my own time.

To be honest, I also romanticized the idea of building the folding screen by hand, add that to a fear of the table saw and made my decision in the

beginning of the design process to focus on manual skills. It is a personal artifact to begin with, so it seemed fitting that I took a more personal approach. Only later in building the prototype did I realize my mistake; I lack the patience that is required to hand carve all the mortise joinery. Perhaps in a different circumstance with a different mindset, I would have enjoyed the process, but the deadlines were looming and progress in the wood workshop was slow. Ideally after realizing how little I enjoyed the process of hand carving the joinery I should have made another prototype with different joints. In my rush to produce a final artifact I blindly forged on with chisel in hand.

My time in the workshop was frustrating because I would have goals in mind as to how much I wanted to accomplish and never seem to achieve it. This can also be attributed to my lack of skill which resulted in underestimating the time that it took to do anything. In those moments, the temptation to turn it into a problem for a machine was incredibly tempting. After all, when I was an undergraduate student being introduced to technology such as the laser cutter and CNC machine for the first time, there was an overwhelming desire to use those machines for even the simplest of tasks. The novelty of those machines often overruled my critical thinking at first. Certain tasks would obviously benefit from using the machines, but others would be faster by hand or using any number of other machinery available in the wood workshop. Through my usage of the laser cutter, 3D printer and CNC over the years, I became acquainted with the shortcomings of each machine. While offering the illusion of efficacy and expediency, the final product resulting from those machines will always require post processing. There will always be undesirable tool marks from the CNC or evidence of the material extrusion from the 3D printer or burn marks by the laser cutter. Of course, there are also ways to prevent such things from happening, but they all require just as much testing and prototyping or even more in some cases in comparison to other methods of construction.

I am not disparaging or at all against the usage of such technology, only simply stating that in my designs, the opportunity did not present itself with a strong enough logical argument. In trying to emanate spirit of craeft, I sought to maximize the materials, resources and time I had in hand to create something that I was proud of and can roughly be called ‘handmade’. This is term, handmade, seems innocuous enough at first but can become contentious once further thought is given to it. The argument

that David Pye gives in *The Nature and Art of Workmanship* is that even the simplest of tools can be considered a machine.[3] Take the folding screen for example, even though I state that I 'hand carve' the joints, I am still using chisels of varying sizes and a wooden mallet. Not to mention, to take away most of the material for the mortise I am using a drill press and then chipping the excess away to make a rectangular hole.

I think the generalized definition of handmade that is widely accepted is that there is some involvement of the hand in the process of making. It is most definitely the definition that most crafters go by in crafts and farmers markets. I say this because if we are splitting hairs about what is handmade then there is no way that crafters do not use materials that have somehow been touched by machinery or use machinery in their craft as well, such as a potter's wheel and kiln in the case of 'handmade' pottery. Going back to the construction of the folding screen, it will be difficult to say that this artifact is hand crafted when at the beginning, even the raw lumber that I bought from A&M Wood Specialty have been rough cut using large machines somewhere. If an astringent definition of the handmade is applied, then it is very difficult to define a whole multitude of crafts as made by the hand. David Pye would only qualify basketry and coil pottery as handmade following such strict definitions. He relents on that thought on the next page where he defines handicraft and handmade as historical and social terms rather than technical ones.[4] And in this thesis, I must remind the reader again that we are seeking to muck about in middle of such definitions and not at the edges.

Craft and the handmade are often grouped together and it is easy to get sucked down the rabbit hole of definitions. However, there are areas of craft that extend beyond the handmade. For example, in the use of advanced machinery such as the CNC and 3D printer, craft is still needed. After all, in the most general of definitions, is craft not simply the desire or aspiration to do something well?

Although this section may seem to be an indictment of the involvement of technology in craft no matter how I argue the contrary, perhaps figure 36, an AI assisted image can convince the reader otherwise. As one can see from the usage of this composite image, I do not avoid technology from a 'purity' mindset. When I was searching for an image to convey my design aspirations, I came up short. Using AI generated images gave me a fast and iterative process where I was able to tweak and combine the images that

were output to reach figure 36. The images that were output by themselves were always inadequate or missing a key element, hence the manual manipulation afterwards. Only by testing and using the software myself am I able to comment on its capabilities and relevancy.

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1. Pye, David. *The Nature and Art of Workmanship*. Revised ed., Repr. London: Herbert Press, 2010. p 22

2. Ibid

3. Ibid p 10

4. Ibid

8 Craefty Conclusions and Reflections

I realize the topics I have covered in the body of my thesis may seem only minimally adjacent to agency and leaning more into craft. From my perspective, my journey into craft has only just begun. The skills and readings I have acquired through this thesis are only the foundation of which I begin to build my own agency. Whether that is as an architect or a craftsperson or both, it is yet to be determined, but I know I will be better informed. Admittedly the title might be misleading in that it promises the reader a handbook on how to craft agency when I have only described my personal search for agency. My hope is that through my journey, the reader can find their own inspiration.

8.1 Crafting Design

David Pye talks about where design end is where workmanship (craftmanship) begins in *The Nature and Art of Workmanship*.[1] My interpretation is that the human perception of the world exists at many scales and while design is something that affects us at a larger scale, workmanship begins to matter more in everything we interact with. Though design may and can dictate everything from the form to method of execution to material, at the end of the day, good or bad workmanship can make or break the design. While good workmanship carrying forward the ideas imbued within the design, bad workmanship can equally distract from the idea or purpose of the design. Pye uses the example of a circular hoop, though the design may call for a circle, if the workmanship is lacking, it may not be a circle or if multiple pieces are used, unsightly seams are certain to detract from the original intention.[2]

Though good architects are concerned with the human scale and design accordingly, the sentiment is often lost in translation for the sake of the grand gesture or cohesive formal language. There are also those who can forget that at the end of the day, the construction industry is composed of humans of varying skill levels. The level at which a project will be executed is very much dependent on those humans with varying skill levels in addition to a multitude of factors out of the control of the architect. To a perfectionist like me, that idea is a difficult pill to swallow.

By engaging in making through leather and woodwork, I have begun to understand and anticipate real world problems and potential mishaps.

This is also perhaps why model making should and will always be relevant in architectural school. Though it is a divisive requirement in projects, not only is it a good method of communicating design, but it is also the only time architecture students pull themselves out of the imaginary world of drawings. In building models of any kind, one must face the realities of choosing a material as well as method of execution, whether it is by hand or automated like 3D printing, all methods require the students to deal with physical aspects of the design that may otherwise go unnoticed. Additionally, during my internship at RPBW I saw how model building fed positively into an iterative design process. I probably spent a disproportionately large amount of time churning out sketch models but it was rewarding to see the models used to demonstrate our ideas to clients and consultants alike.

8.2 Craft Education

In writing about craft, thinking through making and agency, I recognize that I am discussing these topics from a position of privilege. I have parents who nurtured my interests, the space and time to explore my passions and the funds to carry out my ideas.

Throughout the world craft represents more than a hobby, craft is empowerment and a source in income. So, is it not unfair that the skills and knowledge of crafts is looked down upon, to be considered inferior to the arts or to other forms of scientific research? This perceivable inferiority is confusing to me when one considers the years of practice honing one's dexterity and hand-eye coordination in order to excel at a craft. The amount of inherent and obscure knowledge that one possesses after a lifetime dedicated to a particular craft is voluminous as well. Additionally, not everyone possesses the patience, disposition and mind to hand synchronicity to become an accomplished craftsperson.

If then, these are the requirements of 'craftsmanship' then why should it not merit a higher educational institution dedicated to such matters? Upon further reflection however, I realize even the construct of having "an education" is part of a society that has rejected craft and why then, should craftspeople even bother fighting a system that was inherently rigged against such endeavors? Is it not better to simply exist outside of the system entirely? The risk to that, of course, is to risk becoming forgotten from a lack of proper documentation.

8.3 Plastic Value

In the introduction of *The Craftsman*, Richard Sennett likens the unmitigated technological advance to Pandora's box, unleashing both hope and horrors into the world. With the main underlying message of, just because we can, does not mean we should.[3] Although his main example was the atomic bomb (something far more dramatic and controversial), there are plenty of other technological advances that deserve to be questioned. For the sake of relevance to my conclusion, I am questioning the development of plastics and its ability to undercut leather in many instances through a lower price.

Perception of plastics has been skewed to portray the material as convenient, disposable and cheap, as such, plastics have proliferated in our lives. It's devastating impacts often have been shielded from the public eye. When taken in with the environmental repercussions the cost, or rather to use the word that titles this section, the *value* of plastic products should change. So, then the question emerges, why is plastic still so cheap?

Perhaps instinctively everyone knows that leather is more durable and lasts longer than plastic. This idea is taken one step further through the image of leather which high-end brands perpetuate. An image of quality and luxury which increases the value of a leather bag to tenfold or even a hundredfold of its cost to make. Plastic bags on the other hand are flimsy and produced at such a quantity that their presence is ubiquitous in our lives. Each bag only has a fleeting existence in our lives as such their immaterial value is incredibly low. Of course, time is not the only issue, even as we transition to more durable grocery bags, I have not become attached to them. The care that is put into the crafting of leather bags can be seen as directly relational to the amount of care the is put in by the end-user. Mass manufactured plastic bags are shown the equivalent amount of care to the time it took to make them. By this logic the price point of plastic bags is correct, however externalities are overlooked.

The production and disposal of plastics is causing endless harm and grief to the environment and ultimately our bodies. From micro-plastics in our oceans to air pollution of petroleum refineries, the embodied 'cost' that we pay for a ten-cent garbage bag can likely end up in the hundreds of dollars down the road in healthcare bills and environmental remediation.

Of course, my argument is not that leather should replace everything that uses plastic down to disposable garbage bags, but that perhaps like the nutritional value labels on food, plastics should have an environmental label.[4] This can lead to a better and clearer valuation of the product that is being sold. Perhaps this will do nothing to change the price of things, but for the conscious and responsible shopper this could affect decisions. In an ideal world the price tag of plastics should reflect its negative impacts, yet I recognize the impossibility of such a change. The complete upheaval of the foundations a global economy is established upon would be needed.

If we operate under the assumption that craft's 'lower status' originates from the reasoning that machines or automation can easily replace it, then it is reasonable to say that such perceptions were perpetuated by capitalism as well or at the very least, the early symptoms of a capitalistic society.

Raj Patel highlights a concept in *The Value of Nothing* that I had never considered, which is that land and labour was intentionally commercialized.[5] The impact of such an action on craft is that it skewed perception of what could and could not be "sold". By transforming labour into a commodity, what the Victorians effectively did was commercialize time. The value of goods sold at a market was now pennies compared to land and labour costs. Slowly, as an effect of this shift in perspective, it changed how people perceived the value of craftsmanship and craft. After all, as production became mechanized, why would there be a reason to buy something that is ten times more expensive when there are cheaper and, in some cases, better made alternatives. The reason these alternatives are cheaper is mainly because of how little time it takes to make them and because the manufacturing line has been through so many iterations to streamline the process. Production has been maximized thus it is affordable for those in charge to sell their manufactured goods at a lower price. For the craftspeople, in order to make a decent living, we need to charge more for our time and efforts. Of course, ideally in the situation it is also implied that there is also a guarantee of quality and craftsmanship that cannot be found in manufactured goods.

The commodification of time, however, is not the entirety of the reason for the value of craft to be as low as it is. Another factor is the fact that most of the activities that are classified as crafts, such as weaving and basket making, are activities that are dominated by women. Ever since society

decided to assign value to an individual's contribution, the work that is considered to be the role of a woman has been designated as little or no value. There has been improvement, but the systemic bias is not easily rooted out. Therefore, it is not out of the question to posit that because of craft's association with women kind, its value was decreased.

Alas let us turn our attentions back to things that we can control. As I reflect on my purchasing decisions for this thesis, I fear that I have been blinded by a low-price tag. Although I recognize it is nearly impossible to trace the origins of every item that we use daily, it is important to me to put into practice my research. The truth is, there has not been enough care put into the selection of all the materials of my artifacts. Rather than looking at the lowest price I should have been more considerate of externalities.

8.4 Reflections

In Donna Haraway's introduction for Ursula K. LeGuin's *The Carrier Bag Theory of Fiction* she wrote, 'It matters what stories we tell other stories with; it matters what concepts we think to think other concepts with.'[6] Upon that quote I must reflect on the appropriateness of leather as a material in an architectural thesis. Certainly, examining agency and craft and using it as a lens to explore thinking through making, leather is a wonderful and forgiving material. In terms of it being a renewable resource however, leather is a complex or rather, a better word might be controversial material. While leather crafters around the world might comfort themselves with the thought of leather being just a by-product of the meat industry, the tanning process is still caustic and damaging to the environment. The condition in which animals, mainly cows in this case, are held within facilities of large-scale meat production is also dismal to the point of being inspiration for nightmares and horror stories. Cruelty is unforgiveable in any circumstance. Leather may have started as a by-product, but its value has far surpassed the point where it is an innocent by-stander. Within indigenous groups in Canada, there is a moment where gratitude is given to the gods/land which provided the animal for the tanning ritual. This is an important moment where the gravity of taking a life is put into perspective and it is something that the modern food supply chain has managed to distance from the consumer.

Leather is certainly a storied material, its history starting with the first

pelts of animals worn by cavemen to the harness and saddle at the start of agriculture to wineskins and armour in the Middle Ages to the mountain of shoes left behind by Holocaust victims. Whether this material will continue to accompany humanity is not in question, but its ethical and proper use so that we are not suffocated by our waste and pollution still needs to be investigated.

As a craftsperson pursuing a career in the field of architecture, I cannot help but feel remiss about the leather and tools I have ordered from various suppliers. The avenues in which I have purchased everything can and should be questioned. If I were to start from the beginning again, I think I would attempt to tan a small animal skin personally, starting with the capture and killing of the animal. This idea may seem violent and unnecessary when there are plenty of suppliers of leather, but I would be able to better understand and address the gravity of my actions every time I buy a piece of leather. My thesis has been focused on personal agency and this is an important aspect that has been left unexplored. As an aspiring architect it is important to know how my actions and decisions affect others and leave ripples in the macrocosm I call home.

Circling back to a quote that I cited in the first chapter on craft, I believe I was so attracted to that quote because not only does it describe craeft, but also responsible architecture. In replacing a few words, the excerpt can apply to the craft of architecture.

> "It's about more than just [design]. The goal, in being [an architect], is not to use as much as possible of the technology and resources you have at your disposal but to use as little as possible in relation to the job that needs undertaking. This is the resourcefulness [as an architect].... And finally, understanding the materials, making critical decisions about how to approach the work, and factoring in wider financial and time constraints represents the knowledge in [design for an architect]."
>
> -Alexander Langlands, Craeft[7]

Part of the critical decision-making is understanding the true value of materials, including their long-term resilience and sustainability. This involves assessing not only the immediate costs but also the environmental

and social impacts over the building's lifecycle. Responsible architecture demands a thoughtful approach to material selection, prioritizing those that are durable, renewable, and ethically sourced. It also involves designing spaces that can adapt to future needs, reducing waste and extending the useful life of structures. This can easily get lost in a fast-paced, profit-driven environment. As Oscar Wilde so aptly put it;

> 'Nowadays people know the price of everything and the value of nothing'
>
> -Oscar Wilde, *The Picture of Dorian Grey*[8]

8.5 Final Thoughts

Through writing my thesis and crafting the artifacts that go along with it, I have often wondered at the legibility of it all. It is one of the challenges of being a craftsperson. There is often a disparity between what one has learned to make and the instructions that one can produce to instruct others. Richard Sennett in *The Craftsman* discusses this using a chicken recipe as an example. He likens each instructional verb; sever, pull, loosen, to dead denotation.[9] The vocabulary may help those who already prepped a chicken debone it better, but to a novice, the instructions may as well be telling them to fly like a chicken. Another example Sennett uses for dead denotation is pop culture references within writing; he predicts that any writing with such references will be incomprehensible within two generations.[10] It is this particular trap that I fear I may have fallen into while writing my thesis. Though I have tried my best to keep my writing clear of obscure terms or concepts, I do refer to online shopping and video platforms such as YouTube and Amazon. These entities may be indispensable to the modern craftsperson, but I also cannot help but wonder if they will be around in a couple of generations. In my desire to be transparent perhaps I have condemned the relevance and readability of my text to a few decades, but then again it is also presumptuous of me to assume my text will be read in the future.

Despite my doubts, I hope that the reader will be able to glean something useful from reading this work. Similarly, it is my desire that my artifacts will also be useful far into the future. Though I may have set my artifacts up better than my writing simply by choosing to make the things that are essential to everyday life. The wallet and the folding screen may be

superfluous but, a bag, a pair of shoes and a chair are all things that will still be needed no matter where digital advancement will take us humans. With any luck I will be able to pass on the roll top backpack to the next generation, seeing how I chose such a thick leather that anything short of intentional destruction will not damage this bag.

This thread of discussion takes me to my last thought. I came across an interesting phrase while doom scrolling on Instagram; graceful degradation. This phrase proposes that as designers we should think about how the operation of the things we design will fare in case a component fails. Take a computer for instance, it is common now that with all the updates to an operating system that a computer older than a decade will not be able to update. Additionally, it is also common knowledge that batteries and other hardware are designed only to last a certain period before failing. Graceful degradation urges us to design for such eventualities so that, using the example of a computer again, while some parts fail and functioning decreases, the computer can still perform essential tasks. This idea stands in direct opposition to planned obsolescence.

As crafters and more importantly designers, it is important to keep graceful degradation in mind while we design and build. Since it is the consequences of thoughtless production and consumption is killing the planet we call home, it is my hope that with a craefty mindset, we renew our values. In crafting our own agency however, it is of the utmost importance that it is not at the cost of agency of others.

1. Pye, David. *The Nature and Art of Workmanship*. Revised ed., Repr. London: Herbert Press, 2010. p 29

2. Ibid p 15

3. Sennett, Richard. *The Craftsman*. New Haven: Yale University Press, 2008.

4. Duffey, Ethan. “Counting Carbon: Evaluating the Quality and Environmental Impacts of Design Through Product Prototyping.” Master Thesis, University of Waterloo, 2022. https://uwspace.uwaterloo.ca/handle/10012/18306.

5. Patel, Raj. *The Value of Nothing: Why Everything Costs so Much More than We Think*. Toronto: HarperCollins Canada, 2011.

6. Guin, Ursula K Le. *The Carrier Bag Theory of Fiction*. Ignota, 1988.

7. Langlands, Alexander. *Craeft: How Traditional Crafts Are about More than Just Making*. London: Faber & Faber, 2018.

8. Wilde, Oscar. *The Picture of Dorian Gray*. Edited by Robert Mighall. Repr. Penguin Classics. London: Penguin books, 2003.

9. Sennett, Richard. *The Craftsman*. New Haven: Yale University Press, 2008. p 182

10. Ibid p 183

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Appendix

Leather

By definition, leather is the hides and skins of animals which go through a tanning process that prevents putrefaction.[1] Hides are usually used in reference to larger animals and skins to smaller animals. The way that leather is processed and split generates different grades of leather. Ironically 'genuine' leather is the lower grade of leather that is available. This is because the material that is used for 'genuine' leather is inherently from the split grain, a part of the hide that is weaker. Please refer to figure 44, it is a generic cross section showing the composition of a hide. The top/full grain is composed of tighter collagen bundles which produces stronger and longer lasting leather.

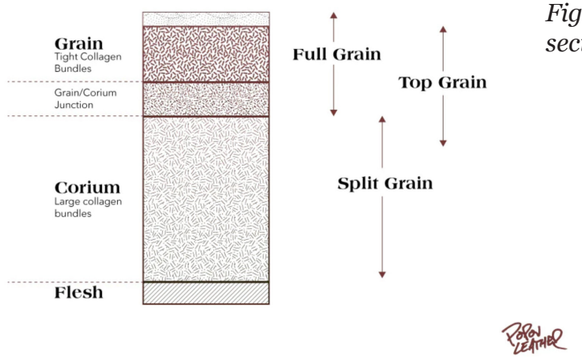


Figure 44 Cross-section of leather

Cows have thicker hides and are most commonly used in the leather industry. One of the first stages in processing cow hides is splitting the hide into the cuts as shown in figure 45. The bottom cut which is composed of the corium layer (fig. 44 above) is then stamped or engrained with a coating to give the illusion of top/full grain to produce 'genuine leather'. This produces leather that is more likely to deform and degrade over time because of the larger and looser collagen bundles which make up the corium layer.

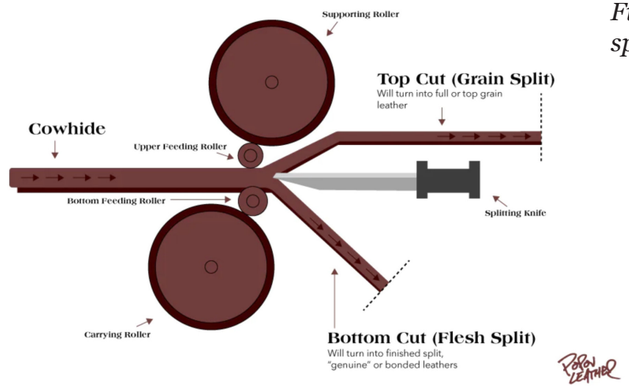


Figure 45 Leather splitting diagram

Different types of animals also produce different tempers (stiffness) of leather. With cowhides thick and rigid, and goat skins being supple and thinner. Sheep are not often used for their hide rather their wool, their dense follicles produce a weaker leather. Pig hides are interesting is that their follicles result in tiny holes in the leather produced.[2] The cross section of hides/skins vary from animal to animal, thus the leather that is produced will also have different characteristics that need to be considered.

Tanning

The process in which hides, or skins of animals are converted into leather is called tanning. As mentioned in the previous section, leather is simply a state of the hide/skin that will not putrefy. There are many methods of tanning which date back to the first inklings of civilization. In an attempt to synthesize the encyclopedic amount of information there is about tanning leather I have decided to focus on a sampling of three methods. Two of these methods are industrial and produce massive amounts of leather yearly, while the third method summarizes an indigenous way of making leather in Canada.

Industrialized Tanning Methods

Although tanning is an ancient technique, the decision to start by introducing more modern methods of tanning is driven by the fact that all the leather utilized to create artifacts for this thesis is produced with these relatively modern methods.

Within industrial tanning there are two processes which will be covered in this section, vegetable or 'veg' tanning and Chromium (III) or 'chrome' tanning. These two processes are inherently different in their chemical composition, and duration to turn hides/skins into leather. Vegetable tanning, compared to chrome tanning, is vastly more time consuming though the impression is that it is more environmentally friendly. One must remember that both processes use large quantities of water.

These two are not the only processes in which leather is produced, there is also oil, synthetic, and combination tanning.[3] However, the two industrial tanning methods that are covered in this chapter, vegetable and chrome tanning, are the most prolific methods currently. Chrome tanned leather consists of around 90% of the world's output now, while vegetable tanned leather dominated up until the end of the 19th century.[4] Hence the focus on these two tanning processes. The aim is also not to bore the reader. For the leather enthusiast that happens upon this thesis, I would highly recommend *Tanning Chemistry: The Science of Leather* by Anthony D. Covington which is much cited in the following sub-sections.

Beamhouse Operations

Initial stages of vegetable and chrome tanning are similar and are covered with the umbrella term 'beamhouse operations'. This is because the tanning has not technically started, beamhouse operations only prepare the leather so that it is in a state ready to be tanned. This term was originally coined because hides were draped over an angled wooden beam and individually fleshed, dehaired and shaved to the right thickness (fig. 46). This back-breaking labor is no longer the standard of operation



Figure 46 Beaming

thanks to the introduction of machines.

Beamhouse operations is a process that came into being due to time constraints and the location of slaughterhouses in relation to tanning facilities. These factors resulted in hides often needing to remain in their raw state for extended periods of time. To stave off bacteria and ultimately, putrefaction, hides are cured with salts for storage and transportation. The first step in beamhouse operations is soaking the hides to get rid of these salts. Next, they are soaked in a lime solution to soften the hides and remove the hair. Although lime is not a desirable chemical to have remain in the hides/skins so then a rinse and deliming solution quickly follows. Afterwards the hides/skins are soaked in subsequent solutions which further prepare them for tanning, these steps are called bating and pickling.

Vegetable Tanning

Then the tanning process starts, and this is where these two industrialized processes vastly differ. Vegetable tanning is named as such because the chemical that is used in the tanning process, tannins, is a plant polyphenol[5] that is found in many diverse types of vegetation around the world. For example, oak and willow bark as well as olive and sumac leaves all contain high levels of tannins.[6] Figure 47 illustrates the reaction of the plant polyphenol and collagen during the tanning process. I must confess that I do not understand the symbols nor the chemical reaction that is occurring, but this diagram is included for those who have a stronger background in chemistry.

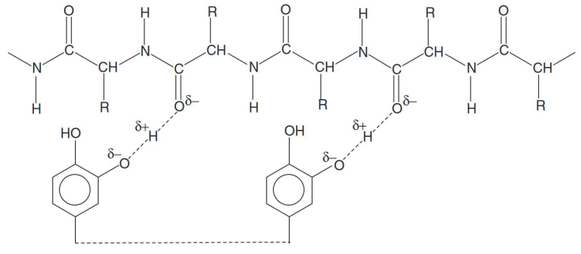
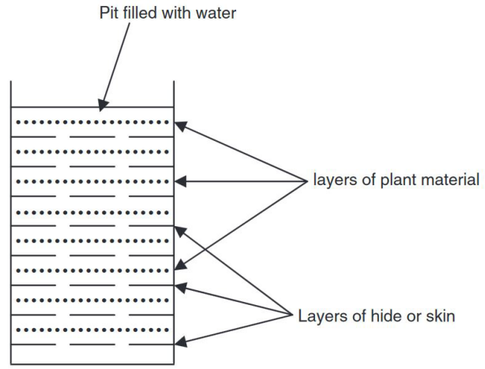


Figure 47 Chemical reaction

Traditionally, plant material is layered at the bottom of a pit and then a hide/skin is laid on top. Then alternating layers of plant material and hides are stacked up until the pit is full (fig 48). Lastly the pit is filled with water. The reaction within this process is slow and thus to guarantee the quality of leather, the hides/skins are left in the pit for at least a year.[7] Modern iterations to vegetable tanning have shortened this tanning period to a few

Figure 48 Traditional veg tanning



weeks. This is done through heating the pits in which the hides/skins are tanned in, rightly dubbed 'hot pitting'.[8] Unfortunately, this causes 'case hardening' which is when the outside layer of the hides is so oversaturated with tannins that the tanning reaction cannot reach the center of the hide. This is not desirable as tannins need to penetrate the entirety of the hide for the collagen to be stabilized against microbiological degradation.[9] To counteract 'case hardening' contemporary vegetable tanning facilities have adopted counter-current pit tanning (fig. 49). This process involves hides/skins being soaked in progressively higher concentrations of tannins.

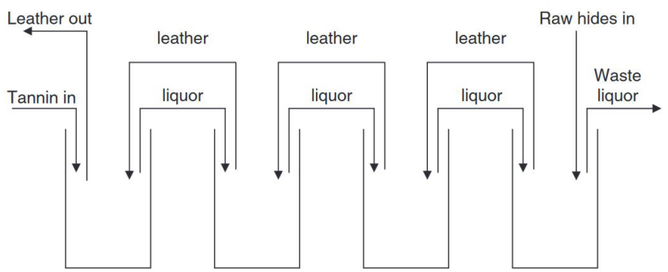


Figure 49 Counter-current pit tanning

That way the reaction rate is controlled so that the tannins can penetrate throughout. To facilitate transferring hides/skins between each vat, they are hung vertically on racks (fig. 50).



Figure 50 Contemporary veg tanning

Chromium (III) Tanning

Comparatively, chrome tanning only takes one day to complete. The hides are thrown into a large rotating drum where Chromium (III) is introduced. A side effect of this chemical is that it turns the hides light blue, thus the term for the hides after this stage is "wet-blue". After the hides are tanned, they are passed through a machine with large rollers which squeeze out excess liquids and grease. Admittedly this is an oversimplification of the process, however upon further research I have realized the chemistry behind chrome tanning extends far beyond my understanding. Perhaps this is a commonality even among tanners thus leading to the improper treatment of the chemical. Chromium (VI), by comparison is the much more toxic chemical and was used in the chrome tanning process for

a while in what is called a two-bath process.[10] However, research has shown that Cr (VI) causes cancer[11] and has since been removed from the tanning industry. It is possible that the similarity in name has caused Chromium (III) to be misconstrued as a chemical with hazardous health effects when, in reality, it is a chemical that occurs naturally in the earth's crust. Although caution should still be exercised as long-term effects of Chromium (III) on the environment and workers still need to be studied.



Figure 51 Chrome tanning

The end product of chrome tanning is leather that possesses many properties that make it attractive to industrial manufacturing processes and product design, this is not even considering the shorter tanning period. These properties include better resistance to heat, waterproofing, capacity to hold vibrant dyes and retention of dyed colour. All advantages from the perspective of an end user looking for a product that maintains its appearance from the day it was purchased to when it is thrown out. However, the same properties that can be seen as disadvantages in veg tanned leather are, in fact, prized among those that know and appreciate handmade leather goods. Since vegetable tanning produces a hydrophilic

leather, this allows the leather to be wet moulded and tooled in such a way that chrome tanned leather cannot. Additionally, while the colour of veg tanned leather can fade, the leather patinas, giving character to the leather.

Indigenous Tanning Methods

Indigenous tanning methods, are, by comparison, much more labor intensive and intimate as one hide is processed at a time. The description below is a limited summary of the tanning technique as most of the research in relationship to this thesis was focused elsewhere

The first step is stretching and framing the hide. Then the hide is scraped of any remaining fat, flesh and tissue. On the flip side, the fur is scraped off as well. For the tanning portion of the process, clean rendered fat is then brushed onto the hide. Next the hide is cut from its frame and –disclaimer this gets a little squeamish, a mixture of water, ash, brain and tallow is applied to the hide. The rule of thumb is that the brain of the animal is enough to tan the hide of that very animal. After, the hide is softened by wringing it and scraping it with a knife. The last step is smoking, this acts as a final drying and sealing of the hide, which provides a certain level of waterproofing.[12]

I have generated a flow chart on the following spread comparing the three tanning processes.

INDUSTRIALIZED TANNING METHOD

BEAMHOUSE OPERATIONS:

Process in which all cured hides go through to prepare them for tanning. This involves:
1. Soaking to remove salts from curing
2. Dehairing
3. Liming, hides are introduced to a solution of lime that softens them

VEGETABLE TANNING 10%

Hides are hung to soak in large vats with filled with tannins, a naturally occuring chemical that binds the collagen in the hides, turning it into leather. This step takes 3-7 weeks

SAMMYING
Excess grease and moisture is squeezed out by passing leather through large rollers
DYEING
FATLIQUORING
Rehydrating leather using oil

CHROME TANNING 90%

Hides are thrown into a large rotating drum and chromium III is introduced. In contrast this step takes 1 day. The hides takes on a light blue colour. Thus the hides are referred to as "wet-blue" after this stage

NEUTRALIZING
Excess acids are neutralized for fatliquoring
DYEING
SAMMYING
FATLIQUORING

DRYING

STAKING
Leather is stretched and punched in a machine to separate fibres, thus softening it

OR

TUMBLED
Leather is put into a dry rotating drum. This also softens the leather and gives it a pebbled pattern

Figure 52 Flow chart

INDIGENOUS TANNING METHOD

PREP FOR TANNING

FRAMING THE HIDE

FLESHING

SCRAPING/DE-HAIRING

TANNING

GREASING
Heat fat/tallow (clean rendered fat) and brush it onto the hide

BRAINING
Mix half gallon water with harwood ashes. In another container mix one moose brain and equal parts fat/tallow. Combine the two mixtures and slow cook over the fire. Remove hide from frame. Ensure brain mixture is homogenous and apply to hide

FINISHING

SOFTENING
Wringe the hide, work the hide with a knife and break the hide with a rope

SMOKING
"Acts as a desicant, preservative and sealant"

Chouara Tannery, Fez

In the early stages of gathering research for my thesis I did a case study on one of the oldest tanneries in the world, Chouara Tannery in Fez, Morocco. This is the precursor to the industrial tanning methods I introduced earlier. In contrast to the chemicals used in tanneries today, Chouara has preserved its traditional process which utilizes cow urine and pigeon guano (poop). This, as one can imagine, produces a very distinct and memorable odour. Tourists that visit are given sprigs on mint to hold under their noses.[13]

Despite the smell, this traditional process takes advantage of waste products in a manner that modern tanning methods do not. In striving to lessen the environmental impacts of tanning, it may be beneficial to re-examine such methods. Though I will concede that the smell was a major factor both in tanneries being moved far away from cities and the societal perception that the profession of tanning is of low status.



Figure 53 Chouara Tannery

Selection

The selection of leather for a project is complex as there is much to consider. A lot of research should go into the selection process or else you might end up with something that you do not want entirely (I have made this mistake many times).

Where the leather originates from the part of the animal is an important factor. The shoulder and the buttocks are areas where the hide is thicker because that is where the animal is most likely to be attacked. The belly is very stretchy for obvious reasons and the neck area has wrinkles from grazing motions. There is also the direction of the corium bundles (the structural protein of leather) to consider, as stretching of the leather occurs more perpendicular to the grain.[14]

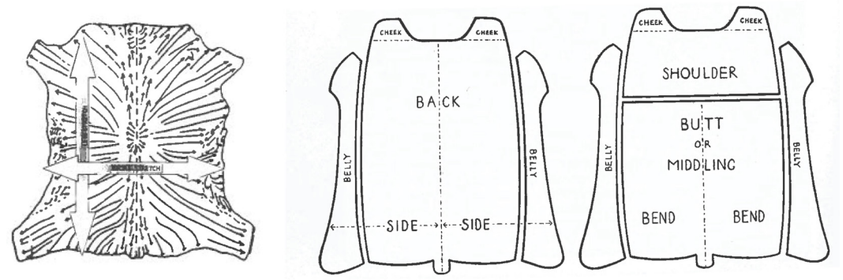


Figure 54 Direction of collagen bundles and cuts of leather

Depending on the project that one wishes to make, temper, the cut of leather, its finish, thickness and tannage all play a factor in the decision-making process. This is not to mention the price per square foot and shipping costs. All to say that to design and make a product out of leather or rather anything, it is crucial to know the material you are using well so that the full range of the material's capabilities can be utilized to the benefit of the design.

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3. Covington, Anthony D. *Tanning Chemistry: The Science of Leather*. Cambridge, UK: Royal Society of Chemistry, 2009. p XV

4. Ibid p 204

5. Ibid p 281

6. Leather-Dictionary. “Vegetable-Tanned Leather - Www.Leather-Dictionary.Com - The Leather Dictionary.” Accessed June 25, 2023. https://www.leather-dictionary.com/index.php/Vegetable-tanned_leather.

7. Covington, Anthony D. *Tanning Chemistry: The Science of Leather*. Cambridge, UK: Royal Society of Chemistry, 2009. p 294

8. Ibid p 295

9. Ibid

10. Ibid p 208

11. Occupational Safety and Health Administration. “Hexavalent Chromium - Overview | Occupational Safety and Health Administration.” Accessed July 5, 2023. https://www.osha.gov/hexavalent-chromium.

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