A SEAT AT MY TABLE

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.

I understand that my thesis may be made electronically available to the public.

ABSTRACT

At dinner, our interactions with the food, the table settings, and other diners show how we engage with the material world. Table manners and etiquette are a window into a convivial life.

As a beginner potter and woodworker, I made dining furniture, dishes, and utensils, to contemplate a meaningful sense of place in the everyday. Participating in what Hannah Arendt calls the *vita activa*, I explore how the objects I make become tangible manifestations of the hands that touch them.

The table setting forms the backdrop for dinner, framing the space, the routine, and the ritual we inhabit every day. They invite us to attend to the food and to the people we share a meal with. In doing so, we bring the forces that gather the meal to light. There are palpable traces of humidity, mineral content, and the gentle touch of the hand in the ceramics. Weather movements, disease, and growth patterns are embodied in the grain of the wood.

Each object translates a microcosm to the table, welcoming diners to touch, smell, and taste the meal we share together.

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For Nathan,

and our life together

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HOME COOKING

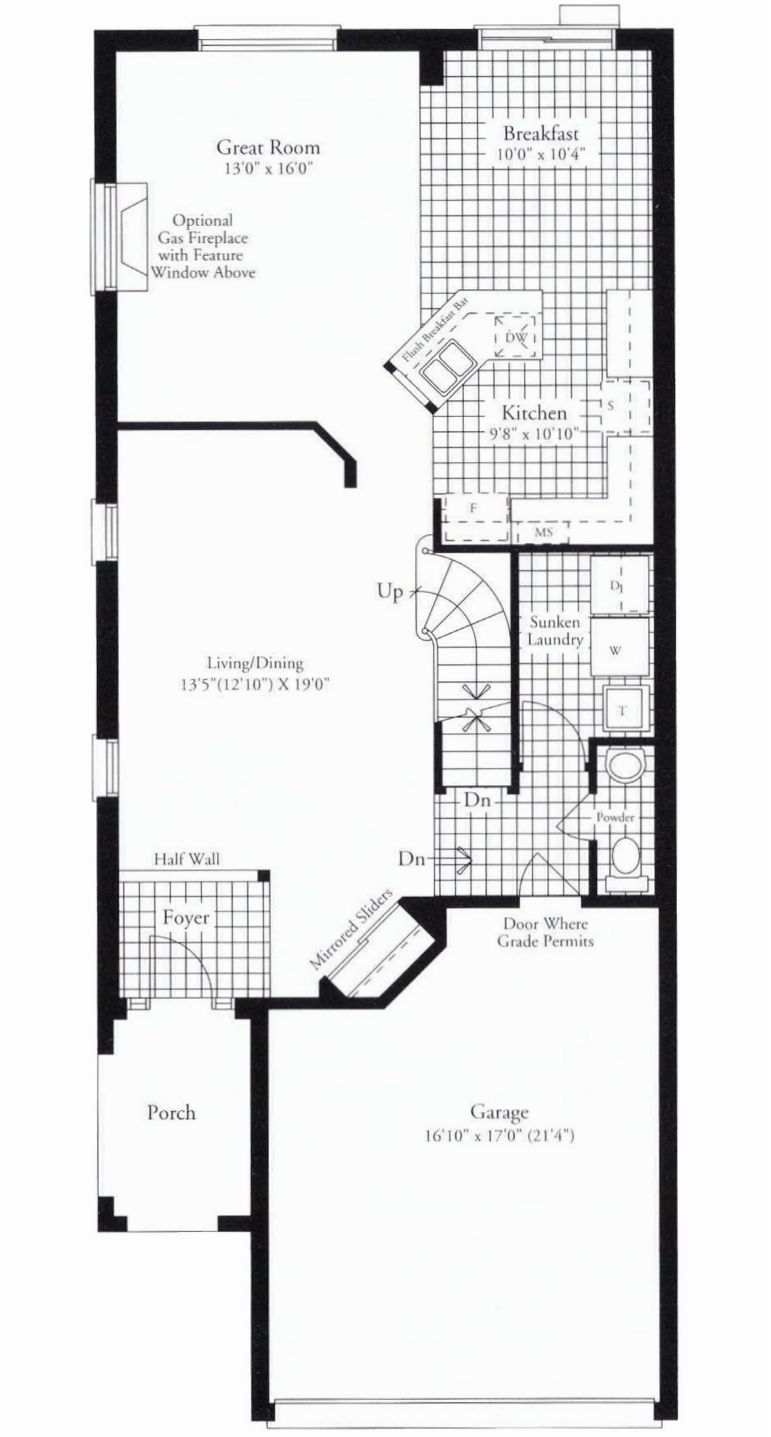


fig. 1.1 The Developer's Ground Floor Plan

My parents immigrated to Toronto from Hong Kong a couple of years before I was born. They came with most of my mom's immediate family. My grandma *po po* (婆婆) and nine of her children, in-laws, and grandchildren moved from compact apartments into the sprawling suburbs of the Greater Toronto Area. My parents, brother, and I ended up on a redeveloped farmland in Markham where our house has a living/dining room, a great room, and a breakfast room. All which is redundant when the four of us live and dine in just two of those three spaces on a regular day.

Most of the time, the designated living-dining room sits empty at the front of the house, except for a couch where we pile our coats and bags when we come in the foyer. When guests come over, we'll set up the dining room to seat more people. Then, we transfer the coats from the couch onto a coat rack. We spend most of our time in the great room and breakfast room, which face the backyard through large windows and glass doors. If you ask, my dad would be proud to point out he added a window to the breakfast room which brightens up the mornings and lets in cross-breezes in the summer.

When there aren't any guests, my immediate family of four eats all our home-cooked meals around the vinyl-covered circular breakfast room table. Before dinner is ready, my mom calls us to eat from the kitchen, knowing that it will take a few minutes before we all arrive. The first person to arrive at the table is usually the one to help her set it. She'll instruct them to place the serving dishes in the center of the table on wooden coasters and a placemat for each person. Then we pour a bowl of soup and set out a pair of chopsticks. Shortly after we set it, everyone is at the table.

Often, we turn on the TV in the adjacent living room to provide ambient noise during dinner. I've noticed that my uncle, *baak baak* (伯伯), and his family do the same in Hong Kong. When I stay with them, we sit at a circular table in their only dining room, which is open to their only living room. On a regular weekday night, my aunt *baak noeng* (伯娘) turns on the TV to the news channel while she is cooking. We usually eat to the sound of TVB dramas when

my cousin comes home later in the evening. Occasionally, if the show is any good, my uncle, much like his younger brother, will eat slowly throughout the meal. As everyone else is putting their individual dishes away, the brothers (one in Hong Kong and the other in Markham) will gravitate towards the couch to finish their last helping of soup a few feet from the dining table.

Even when it is ignored, the TV gives a sense of liveliness to the otherwise quiet dinner in our nuclear family. A couple of generations before me, my grandparents *yeh ye* (爺爺) and *mah mah* (嫲嫲) lived in a traditional Hakka walled village encompassed by a large wall. They lived on a farm with *yeh ye's* parents, brother, sister-in-law, children, grandchildren, and animals. A small team of women would cook meals for the whole family in large woks on wood-burning stoves. It has since been redeveloped into a Mass Transit Railway station, dispersing the family into the urban and cultural fabric of Cantonese Hong Kong. Now in Markham, the antics of another family on the TV screen echo the chatter of three or four generations of grandparents, parents, uncles, aunts, children, siblings and cousins that once shared every meal.

The last remnant of these multi-generational dinners finds itself in single-family houses in Canada. On holidays, my mom's family gathers for potluck dinners. My *po po*, aunts, uncles, and cousins will congregate from around the Markham-Scarborough area of Toronto to eat some combination of a broth-based soup, steamed rice, boiled and stir-fried vegetables, poached chicken, pork in various forms, and depending on the occasion, turkey with stuffing. If we're eating at our house in Markham, the older generations eat in the formal dining room around a rectangular table. Because the set only has six chairs, we pull out the stools from the basement to add more seats to the table, parked in the corners of the table between the upholstered dining chairs.

Despite all of us being in the age of majority, my cousins, brother, and I sit at the designated kid's table in the breakfast room.

The six of us usually fit around the usual breakfast table set up. Every few years when our Australian cousins are in town for dinner, we pull the breakfast room table apart to extend the table and bring out even more stools from the basement. At this point, we're starting to spill into the great room.

Each seat is set with a bowl for soup and a pair of chopsticks. The extra soup and rice are set on their pots in the kitchen and the rest of the dishes are in the dining room with our parents' table. We split larger dishes, it into two serving bowls, one for each table. After finishing our soup, we help ourselves to a bowl of rice in the kitchen and go over to the dining room for the rest of the meal. My cousins and I reach between aunts and uncles to get our vegetables and meat as they continue their conversation. This happens again every time one of us wants a second helping. When we've had our fill of dinner, we usually end up in the great room for board games and dessert.

At the end of the evening, everyone else goes back to their home in Markham, Scarborough, and eventually Sydney. My parents, brother, and I put away the dishes and pack up the extra furniture. The formal dining table no longer has plastic stools and the round table fits neatly in the center of the breakfast room again. Our house looks exactly as the developer would have imagined our North American home, with everything in its assigned room for our family of four.

By the time my parents were born and raised to adulthood in Hong Kong, their Cantonese had lost traces of the Hakka dialect and the Guangdong village accent from their ancestors. Their traditional foods were kept in the bubble of their own house, somewhat preserved from the rest of the city. Each successive generation of my family has cooked a bit more like their neighbours, introducing new ingredients and local dishes to their new home. Now that they live in Canada, their home cooking continues to change with a different variety of groceries available. Each change in location reinterprets

an existing culinary practice into a new context. As Ivan Illich and Barry Sanders describes, it translates the contents of one practice and readapts it in the language of another[1].

Now, as I prepare for my own home apart from my parents' and move out of student housing, I have started by making my own dining set. In an attempt to understand the role of architects in everyday life, I set out in an exegetical exercise, making furniture and tableware, one of the many ways people inhabit space at the scale of the body. The table, the chairs, and all accompanying tableware set a place for inhabitants to hold an event, which in this case, is a meal.

Each item in the table setting is part of a family-style meal in a format that is familiar to me. There are shared dishes, *sung* (餸), served with rice, *faan* (飯) for each individual. They are made with the materials available to me, white stoneware clay and black walnut wood, employing basic understanding of the craft of pottery and woodworking.

As Tim Ingold describes, I bring natural resources together with symbols of tradition to make an artifact of material culture[2]. The objects are a symptom of existing social values and convictions, but once created, they engage the world to reshape the very values that they reflect. On a fundamental level, the dishes are a framework for presenting food, one of the simplest ways of enjoying life. They present the pleasure of tasting the fruits of nature and our direct relationship with the natural world. Tableware elevates our basic

1. Ivan Illich and Barry Sanders, *The Alphabetization of the Popular Mind* (San Francisco: North Point Press, 1988), 52.
2. Tim Ingold, *Making: Anthropology, Archaeology, Art and Architecture* (London: Routledge, 2013), 20.

need for food from a physiological necessity for a social and cultural event[3].

In making, I prepare for a dining event that has began before my involvement in it. When we pause before a meal to express our gratitude, we recall the work that has brought the meal together: a cook prepares the ingredients in the kitchen, farmers cultivate the plants and raised livestock, and the elements provide the nutrients that feed us. We quiet our minds of the anxieties of the day to remember the sacred gifts before us[4]. In contemplation, we begin to evoke glimpses of the numinous, awe-inspiring world around us[5].

In our stillness, the animals, plants, and land move from instruments of our consumption to icons for a world that transcends our individual existence[6]. We look beyond ourselves to see our dependence others in the world. For Sergei Bulgakov, the everyday act of eating joins the diner in a metaphysical communion with the universe[7]. By consuming food, a part of the external world is brought in our bodies and we become united with it.

The material elements in rituals make the lofty, spiritual facets of our human experience visceral. The role of food is essential in the Christian Eucharist, according to Norman Wirzba. In eating a piece of bread and drinking wine, the participant palpably receives the symbol of Christ. When the devout ingests the bread and wine, it

3. Madeleine Leininger, "Some Cross-Cultural Universal and Non-Universal Functions, Beliefs, and Practices of Food," in *Dimensions of Nutrition*, ed. Jacqueline Dupont (Boulder: Colorado Associated University Press, 1970), 154.
4. Norman Wirzba, *Food & Faith: A Theology of Eating* (New York: Cambridge University Press, 2011), 192-193.
5. Rudolf Otto, *The Idea of the Holy* (London: Oxford University Press, 1950), 7.
6. Ibid, 31.
7. Ibid, 30.

fig. 1.2 The Developer's Illustration

provides sustenance to live physically and faithfully. In doing so, the food transcends beyond its finite material existence, metabolizing into acts of faith[8].

In the creative process of designing and bringing an object in the world, I am taking part in what Hannah Arendt calls the *vita activa*. Compared to the individual endeavours of labour, which is an endless toil for human survival, and work, which creates durable objects to ease the pain of labour, the *vita activa* allows people to reveal themselves in relationship to one another through action and speech. The *vita activa* imbues human activity with a sense of meaning. In making my dining set, I work with the materials to create a tangible form for the intangible aspects of the human condition. As a result, the objects I make affect myself as its human maker[9].

My contribution to the event of a dinner meal is to provide a space for food to be enjoyed. As a potter and woodworker, I take part in and reflect on a process that far precedes when I first touched the clay and the wood. The crystallization of the minerals and the growth of the tree are a much bigger part of making the tableware than my hand in them. In my short time with these materials, I bring their presence into a meal as they house people and food. I make these objects knowing that their lives have started long before my intervention and will continue long after their intended use as a table setting. My role as an architect, designer, potter, and woodworker is a small part of their timeline.

8. Ibid, 202.
9. Hannah Arendt, *The Human Condition* (Chicago: University of Chicago Press, 1958), 8-9.

TABLEWARE

fig. 2.1 The Table Setting in Richard Serra's "Horizontal Rectangle to the Floor"

fig. 2.2 Bag of Clay

The raw materials of the ceramic clay and glazes begin from the earth's crust when cooled magma emerges from the center of the earth, forming igneous rock. Once on the surface, sun, wind, rain, free-thaw cycles, and wild plant growth breaks down the rock. Layers of accumulated plant and mineral matter cements the eroded rock in a new, sedimentary rock. Pressure and temperature recrystallize the rock in a third form, metamorphic rock[1]. Each part of the earth forms a different composition of minerals and clay according to their particular geology.

Traditionally, potters were intimately tied to their land, using clay dug from their local region. The clay mineral kaolin is named after *gou leng saan* (高嶺山) the mountain near Jingdezhen (景德鎮)[2]. The town's proximity to an abundance of petunse and kaolin for clay, wood for firing kilns, and the Yangtze river (長江) to transport wares provided natural resources for the fabled birthplace of porcelain. The wares sourced from this region would always be composed of its land.

The clay I work with in Cambridge comes as a 10 kg block in a plastic bag selling for $20, including taxes. Kaolin, crystalline silica, nepheline syenite, kyanite, and titanium oxide formed by eons of geologic processes are extracted throughout the earth's crust, pulverized into dust, and mixed in Tucker's Pottery Supplies Inc[3]. Brought out of their original landscapes and bearing little resemblance to any of them, the homogenous mix of minerals is formulated for potters, especially beginners like myself, to make our

1. Robin Hopper, *The Ceramic Spectrum* (Radnor: Chilton Book Company, 1984), 44-45.
2. Edmund de Waal, *The White Road* (New York: Farrar, Straus and Giroux, 2015), 31.
3. "Safety Data Sheet," Mid Smooth Stone, Tucker's Pottery Supplies, last modified February 14, 2018, https://tuckerspotteryeshop.com/wp-content/uploads/msds/clay/Mid Smooth Stone - English SDS (2018).pdf.

fig. 2.3 An Individual Table Setting

own creations.

Conveniently for me, the processed uniformity of the clay makes working with this material very forgiving. As a beginner, I lose many bowls by throwing the clay- off centre. Thankfully, I can recycle wet clay into a new piece. If it is wedged to remove all air bubbles and the moisture content is even throughout, I can throw it on the wheel again without visible trace of the former. As a result, pottery is easily iterated with very little waste. Within minutes, I can throw a sketch of a form on the pottery wheel and if it falls apart, I can make another piece.

fig. 2.4 Throwing a Rice Bowl

Finding the Center

I shape the ceramic tableware in a single sitting on a pottery wheel, while it is moist. When I first place it on the wheel, the clay will shake as it rotates on the wheel, because all the lumps in the clay are unbalanced around the center of the wheel. The ball of clay will spin uncontrollably until it calms down as my hand smooths it over to bring every part of the clay to be even around the center. This first step of centering is the hardest for new potters to learn, but also the most important. It prepares the clay so that the pot can be formed evenly on the wheel.

I must be patient to bring the clay to center, positioning myself to be ready to work. Control comes from a steady body position, starting with sitting comfortably on a chair with my feet flat on the ground and resting my elbows on my knees. Like many of the smaller-statured potters in the studio, I use a couple stools to elevate my feet so that I can support my arms on my knees above the tall wheels. This keeps my arms and hands steady when working with the flailing clay.

I must be in tune with my how my body is positioned to the clay, feeling for how the clay is responding to my touch. When my hands are well-supported, I can feel the irregularities in the clay spinning in my palms. I can feel when the clay is moving toward or away from my hand to find which parts are uncentered. I bring it in with one hand compressing the clay and the other supporting it to control how far the clay moves. When the clay is soft with water, my hands are able to guide it gently. When it starts to tug at my fingers, I know I need to add water. The clay takes on the shape of its maker. When I compress it, it takes on the profile of my cupped hands. When I want the clay to be taller, I push with one hand on the side and with my other hand on top, receive the clay as it rises.

When I was learning how to throw pottery for the first time, I relied on brute force to center my clay. Without careful attention to the entire ball of clay, I focused on singular points and

fig. 2.5 Throwing a Rice Bowl

unintentionally pushed the clay out of center in the other parts of the clay. The clay needed to be supported on every surface along its profile so that when one part is being compressed, the others stay in form.

The moment the clay is centered, I gently lift my hands. My hands need to be relaxed as I do this. A stiff hand will stick to the clay and shift it off centre, while relaxed hands will be able to peel themselves gradually off the surface water tension. As Richard Sennett describes, the craftsman's control and accuracy come from their ability to restrain power and release their grip[4]. With a sensitivity to the material, I can learn to use minimal strength to guide the clay to centre. From there, I can begin the delicate process of creating a pot.

4. Richard Sennett, *The Craftsman* (New Haven: Yale University Press, 2008), 171.

fig. 2.6 Dry Brush Stroke

The Trace of the Hand

Like each brushstroke of Chinese calligraphy, each pull on the pot is the trace of a hand gesture. One can see where the artist had touched the paper with a brush and where they had lifted their hand. When I look at calligraphy, I follow the strokes of the brush and imagine myself as the artist. I follow each movement with my mind's eye, pressing my imaginary brush down on the paper and pulling it across the page with the calligrapher. Towards the end of a sweeping stroke, I lift the brush until only the last hairs on the tip are grazing the paper.

To make a pot, I open up the middle of the clay to form a well in the center. Running my fingers along the bottom of the well, I compress the clay to form a strong base. Then, I pull the walls of the pot up with my palms together so that both hands are always supporting one another. It helps me feel the thickness of the clay with the palms of my hands as a reference. The form of the pot follows the shape of my hand as I press, pull, and pinch the clay. The inorganic material takes on the memory of the organic being acting upon it.

At my skill level, the hardest part of throwing on the wheel is pulling the clay up evenly. I am often impatient. I can tell that I am pulling up too quickly when the rim begins to be uneven as I pull. With too much speed, the clay doesn't have a chance to rotate fully around the wheel, which displaces the clay to the top and creates the asymmetrical rim. The clay forms ridges where my fingers have pressed too hard. Light pressure is enough to move the clay without needing to force it into shape. I pull the walls of the pot up to stretch them to length, and then I guide the walls to form the profile.

When I look at other potters' work, I use my fingers to trace where their hands have been. I can feel how thick they've chosen to leave their bottom. I can caress the bottom of a bowl to feel how their hands have compressed the foot. The surface of the bottom follows the curve of their thumb, and the walls trace the movement

fig. 2.7 Trimming a Rice Bowl

of their hands. With two fingers on the inside and outside, I follow the gestures as they pulled the clay up. A skilled potter will have even walls from the bottom to the top.

When I flip the bowl upside down, I can see which tools the potter used to trim the pot. Sharp corners come from using square cutting tools, rounded profiles follow the curve of their tools, and a smooth finish comes from compressing the clay. It is best to trim when the pot is dry enough to hold its own form under some pressure, but moist enough to cut with the trimming blade. The potter trims the pot by turning the clay into the cutting edge of the tool. The potter supports their hand where they want to cut and lets the wheel turn out long strands of clay shavings.

Dry clay will be powdery when trimmed, which creates the risk of breathing in crystalline silica and titanium oxide. To avoid the long-term effects of carcinogenic residue in the lungs and the immediate frustrations of having to trim a rock-hard piece of clay, the pot can be soaked in water to rehydrate its surface. As long as it hasn't been bisque fired yet, the clay is forgiving. To a certain extent, cracks can be repaired and deformations can be readjusted back into shape.

Once bone-dry and cool to the touch, the clay is ready for its first firing to bisque it. The pottery kiln bisque fires to a low temperature of cone 06 (998 °C). From this point on, the clay is no longer pliable. The particles of clay melt together into a nonporous mass[5]. Residual traces of water evaporate and all organic material burns off in the heat. The fire petrifies all traces of the hand and tools that form the pot so that it can no longer be easily shaped. Its form is solidified.

5. Bernard Leach, *A Potter's Book* (Great Britain: Transatlantic Arts, 1973), 35.

fig. 2.8 Throwing an Uneven Bowl

RICE BOWLS

Chinese cuisine begins with grains. The word for the staple cooked rice or grains, *faan*, is also an all-encompassing word used to describe the entire meal. In southern Chinese cuisine, steamed rice is the most common staple, instead of bread, noodles or millet which is more common in the north. Every individual at the table is served with a bowl of *faan* to eat with the main dishes in the meal, the *sung*. Regardless of regional variations, every guest is brought together at the table to share the same meal, starting with the same *faan*, and partaking from the same *sung*.

The sameness of each individual bowl is what makes the set, which is contrary to the nature of making objects by hand. As David Pye describes, making by hand constantly puts the work at risk[6]. At any moment, a lapse of judgment, dexterity, or care can jeopardize the work. Pottery on a wheel uses only the guidance of a few simple tools and relies on the free, otherwise unsupported hand, to throw a pot.

I started the set of rice bowls by centering a 1 lb. ball of clay for each piece. Because my hands are small, I can center proportionally small amounts of clay with relative ease. I can wrap both hands around the clay to feel and adjust for the minute differences without my fingers getting in the way of each other. Despite being able to center the clay with ease, I sometimes use too much water,

6. David Pye, *The Nature and Art of Workmanship* (London: The Herbert Press, 1995), 20.

fig. 2.9 Another Uneven Bowl

overworking the clay until the bowl collapses. Sometimes, I don't use enough, so that the friction of my hands tears the clay apart. I have trouble pulling the clay up with even pressure, resulting in uneven rims, if they even manage to stay intact.

To make a set of bowls, I have as a beginner potter, the added challenge of trying to replicate bowls that I already have trouble throwing. No new pot is ever an exact replica of the one that came before it. As much as I'd like to say that I've designed a bowl, I think it would be more accurate to say its form emerged. As a designer, I have an idea of how I'd like my bowls to have a wide, open rim to present the rice, and I might have a sense of how I want the foot of the bowl to meet the table, but the work is at the mercy of my ability as a potter, which produces varied results. Pye compares a designer with a composer where the design and score are essential to the work, but will only be as good as the craftspeople and musicians who execute it[7].

As the designer, I start by drawing a bowl that I'd like to throw, as the first iteration of the work. As the potter, I practice throwing that shape in hopes of producing enough to form a matching set, although none of the bowls in the supposed set are ever exactly the same. Sometimes a bowl with an unintentionally wider rim feels more balanced with the other pieces in the dining set than the original shape that I had planned. Thus, the forms that I wouldn't have otherwise conceived of began to adjust my ideal image of the bowl for the next iteration, each successive set emerges from the ones that came before it.

My standard of uniformity grew with my skills as a potter. The accidental form and improved control formed the new ideal image of the bowl. With each new measure, I threw another generation of bowls, and continued the cycle. Many bisque-fired bowls later, I realized that the cycle of obsession, given completely free reign, would outlast my graduate studies. I made multiple sets of

7. Ibid, 17.

fig. 2.10 Another Uneven Bowl

functioning bowls.

At a certain point, each set no longer built on the previous. Sometimes I wanted a wider bowl, sometimes it should be taller, and then the wider, taller bowl just didn't have the right proportions. The bowls became distinct sets on their own, relating the other tableware in different ways, rather than a growing pursuit of a singular idea. If I took a break from throwing the bowls, I would lose my muscle memory for throwing the form, so the next set of bowls I threw in each session of throwing would inevitably take on a slightly different shape.

So, I resolved to leave the set as it is, with each slightly different from the next, and each generation different from the previous. As my skills grow as a potter, and as different uses of the bowls change, I can throw more sets, each one serving a different meal according to what is most appropriate, rather than trying to make a universal bowl to encompass all of them. Instead of making identical copies of an ideal form in each individual bowl, the ideal becomes expressed in the average of the six bowls included within the set. No single bowl embodies the form, but the six together suggest the ideal, one that can never be attained.

While each set I make will mark another stage in my growth as a potter, the purpose of the bowls will remain the same. No matter what set of bowls I make, the shared purpose of serving *faan* to each guest will suffice to bring people together for a meal.

fig. 2.11 Black Walnut Soup Bowl

SOUP BOWLS

At my parents' house, a bowl of soup is served with the rice. We drink the soup first to whet the appetite. In meals when table space is limited, only one bowl of soup is plated. After drinking the soup, individuals can use the same bowl to help themselves to a bowl of rice to eat with the *sung.* Some families drink soup after eating the rice, rather than before. My brother, who helps himself to several servings of soup in a single meal, drinks it before and after eating.

Functionally, there isn't a lot about these wooden bowls that make them especially good for soup. Because I had another set of bowls made out of clay, I decided these wooden bowls could be used for soup. Wood has the small advantage over clay of being insulating, which allows the hand to pick up the bowl while it is still steaming. They keep the soup warm while it sits on the table. That being said, if the soup is too hot to be picked up in a clay bowl, it probably is too hot for drinking anyway.

My journey as a woodworker began with turning on the lathe. At the time, it was the least intimidating machine in the workshop. The lathe has no sharp blades except for the tool in my hands that I held facing away from me. I wore a hard-plastic face mask to protect myself, and I could use a built-in shield that covered the entire length of the machine for additional precautions. On top of all that, I could also run the machine as slowly as I felt comfortable with, which at the beginning, meant that I took a long time to carve each piece, but I was safe.

To begin my set of wooden bowls, I cut a single 3" thick slab

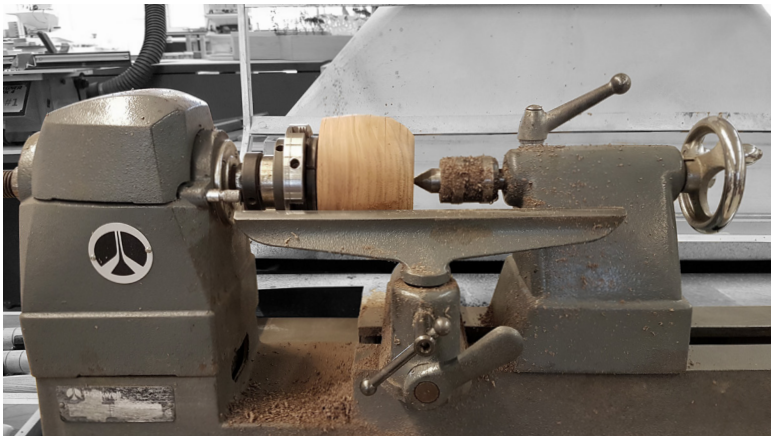


fig. 2.12 Black Walnut Bowl on Lathe

of black walnut wood into six roughly cylindrical bowl blanks. The machine is simple to use in concept: the lathe spins the wood on its axis as I cut away its profile. In every step, I am removing the negative of the bowl to bring out its form. Once I have my blanks, I drill a hole in the center of the top side to attach it to the lathe headstock.

Starting with a slow rotation, I use the roughing gouge to smooth out the band saw marks and round off the blank. Like in pottery, I was bringing the wood to be centered around the machine's rotating axis. I rest my roughing gouge on the tool rest to carve the wood into a smooth cylinder. As the lathe rotates the blank into my tool, I shave off excess wood until the blank is no longer vibrating on the machine. This is how I know there is an even amount of wood rotating around the center of the lathe and that the wood is centered.

Unlike the rice bowls, where each bowl is an approximation of an ideal, the set of wooden soup bowls are derived from the first original bowl, which Walter Benjamin calls the authentic work[8]. The authentic work is unique in which the others are copies. The outside profile is carved to fill the palm of my hands as I hold the bowl, shaped with spindle and bowl gouges. I use the tools to draw the profile of the bowl, starting with the widest tool to roughly shape the profile according to some sketches. Then, I work my way to the smallest radius to carve finer details around the foot. Each cut follows the profile of the bowl, working from the top of the widest part of the bowl, to the bottom of the narrowest to avoid tearing the wood grain.

Compared to throwing clay on a wheel, wood turning can

8. Walter Benjamin, "The Work of Art in the Age of its Technological Reproducibility", in *The Work of Art in the Age of its Technological Reproducibility and Other Writings on Media,* ed. Michael W. Jennings et al. (Cambridge: Belknap Press, 2008), 21.

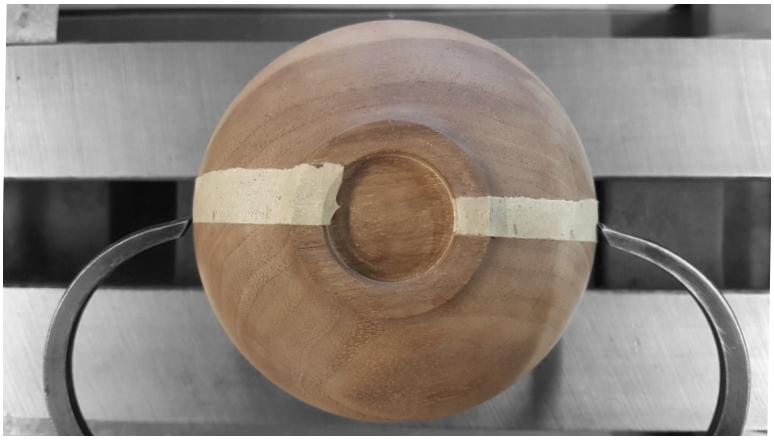


fig. 2.13 Measuring the Diameter

be a slow process. I am shaving away a fraction of a millimeter of wood each time the tool makes contact with the bowl, and I won't be finished until I remove enough material to establish its shape. The kiln-dried wood is stable and not as immediately sensitive to changes in moisture as the unfired clay, so I can carve its shape, walk away from the project to refresh my mind, and revisit it again at a later time to adjust its shape. If it feels too wide around the foot, I can trim it down, or if I want the rim to taper in slightly, I can shave it down.

I occasionally stop the lathe to rest my hands on the bowl, allowing its form to fill the cup of my hand. I turn my body to the side and imagine myself holding the bowl with soup inside. With the bowl still on the lathe, I pretend to lift it with the side of my palms. Perhaps it can hold a serving of *po po*'s green radish and carrot pork bone soup. Where the profile feels too big, I start the lathe again to cut it down.

The foot is just tall enough to slip my hand under when I lift the bowl. A tight curve leaves a spot for my fingers to rest on the bottom of the bowl. The inside diameter of the foot is the minimum size for fitting it on the lathe.

After carving the inside of the foot and sanding, I flip the bowl to attach the foot to the headstock. Up until this point, the wood has been a solid mound with only a small hole to mount onto the jaws. After shaping the outside, I can begin to hollow a basin to carry food with the bowl gouges. Aggressive cuts dive into the wood to dig out as much as possible. Every volume of material removed becomes the bowl's capacity to hold new materials.

To carve the inside, I draw the inner profile of the bowl by following the outside as closely as possible. From time to time, I check the thickness of the walls with my thumb and middle finger. Typically, good woodturning is characterized by even wall thicknesses throughout the bowl, but I can only carve the bowl until the ventilation fan beside the lathe gets in the way of my tool. The long bowl gouges that I was using at the time were too long to rotate

fig. 2.14 Soup Bowls and Chopsticks

to cut the bottom of the bowl, and the shorter tools that I was using were to wide to cut the tight radius. So, I left the bottom of the bowl thicker than it would be following conventional woodturning practice. This left my bowl heavier than another typical wooden bowl of this size. The thicker bottom raises the food in the bowl to sit higher, insulating the hot food from the table. Once the bowl was carved, I sanded the inside.

As with all manual work, the subsequent bowls in the set will always be imperfect reproductions of the original[9]. I copied the first bowl by mapping the diameter of the bowl at every 1/4" increment from the rim of the bowl and then in finer increments of 1/8" increment towards the foot. Then after marking the reference points on the copy, I carve to the diameter at every point and connect the dots. The resulting profile is derived from a series of 1/4" or 1/8" lines between each reference point.

If the bowls were measured by their accuracy of reproduction, they will always be poor copies of an original. Woodturning by hand is both inefficient and inaccurate. While the map of the contour provides guidelines for the rough profile, it doesn't provide enough reference points to create an exact replica. Each individual bowl is unique to its own moment because the hand carves a different line every time it makes a cut.

Sometimes the line cuts straight to the next point, sometimes it has a slight swell that gently meets the next point. The most obvious differences come from a lapse in judgement, when I miscalculate the reference point. In one bowl, I've carved a smaller diameter in the wrong spot, creating a profile that is steeper than intended. The foot is also too narrow. In another, the foot is too wide. Every difference of 1/32" is visible to the attentive eye. The manual reproductions begin to form their own here and now, never reproducing the unique original, but instead, reflect their own circumstances. Rather

9. Ibid, 21.

fig. 2.15 Soup Bowls Among Tableware

than exact copies, they become variations on the first theme.

Even with perfectly replicated contours, which can only be cut by machine, the bowls will always take on the unique character of its wood grain. Each of the six bowls were cut from different parts of the same slab of wood. Three of them were cut from the near the outside of the tree where their grain is split between sapwood and hardwood. The other three are cut closer to the center of the tree, completely embedded in the hardwood. Each individual bowl marks a different segment of the tree.

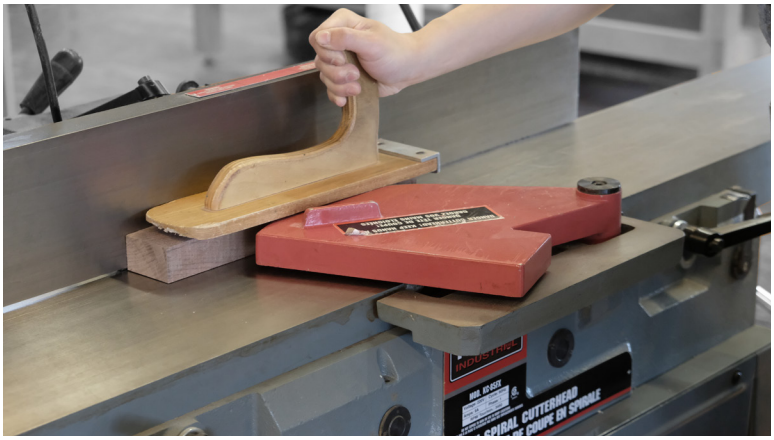


fig. 2.16 Jointing a Face

fig. 2.17 Jointing an Edge

fig. 2.18 Chopstick Jig

CHOPSTICKS

The constituents of a Chinese meal are made to be eaten with chopsticks, including parts of the soup. Every piece of food is cut into small bite-sized pieces to be picked up. Larger foods, like fish or glutinous cakes, are cooked soft enough to be cut apart with chopsticks. Each bowl is accompanied by a pair of chopsticks, which act as an extension of the hand, picking up small pieces of food with precision.

Spoons are used in meals such as congee, soup noodles, or dessert to drink the soupy base. Every surface of the spoon extends up the length of their shaft to hold liquid foods, like a handheld bowl. The clay is folded to give an otherwise very brittle material a stronger shape.

The chopsticks in my dining set are made from scraps of black walnut wood, using a block plane to shave the wood into shape and a jig to hold the wood in position.

The jig has three slots to hold rough wooden blanks in place so that I can taper eight faces on it. Each surface on the jig needs to be at a perpendicular, parallel or at a 45° angle to one another, which means that I had to learn to use the jointer, planer, table saw and router all for the first time.

These first steps of preparing the wood on the jointer, planer, and table saw are the foundational steps to working with wood. To the human hand, a tree's bends and twists make it difficult to work with in its original form. Its shape is complex, registering

fig. 2.19 Chopsticks

its growth towards the sun in response to wind, rain, topography, and neighbouring plants. It is hard to control, so we cut out the irregular, unpredictable edges.

In order to make a jig for chopsticks, I simplify the wood to an abstract geometry. The jointer, planer, and table saw, cuts out the bumps on each side of the wood until it becomes perpendicular or parallel to the others, forming a rectangular box. It allows me to make precise measurements off a few points and lines.

Once the box is formed, I carve the chopstick slots with a router. I carve two rectangular slots, and a 45° angle in the third slot. With these three slots, I can taper rough sticks of wood into an eight-sided chopstick. I use the first rectangular slot for shaping rough sticks. It holds the rough pieces in place as I shave the wood with a block plane to a square profiled chopstick blank. I use the second slot to taper four sides of the wooden blank to create a narrow tip at the end of the chopstick. The third slot turns the chopstick at a 45° angle to taper four additional sides, forming a total of eight tapered sides out of a sliver of a tree.

In public settings, serving chopsticks, *gung faai* (公筷), are used to allow diners to take food from the shared dishes without contaminating them with utensils that have been in their mouths. The serving chopsticks are identical to the pair of chopsticks for individual diners except that putting them in the middle with the *sung* imbues them with a sense of cleanliness. They are only used for transferring food from the shared plates to the individual bowls. On a regular day among family, it is less adhered to but when someone is sick, it is of utmost importance in preventing germs from spreading.

Oftentimes, *gung fai* are distinguished from the individual chopsticks by a different colour and longer length. The serving chopsticks in my set are made of the sapwood from the black walnut wood leftover from my furniture, while the individual pairs are made from the heartwood.

The sapwood is the layer of the tree underneath the bark, which

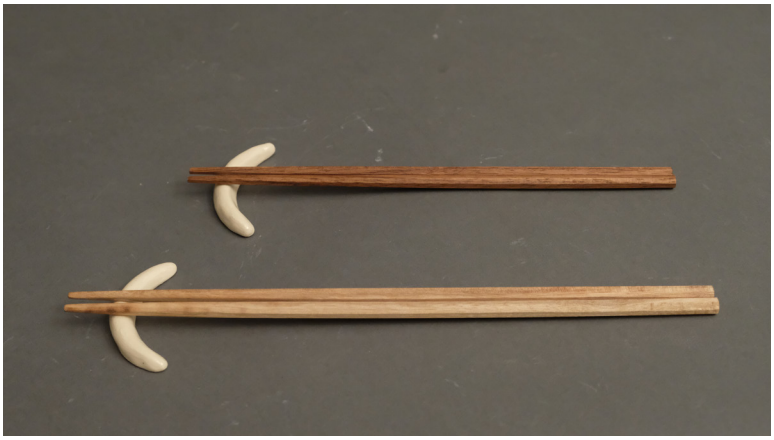


fig. 2.20 Individual and Serving Chopsticks

carry water from the soil through the roots to the rest of the tree. In black walnut, sapwood is naturally white. Over time, the cells die and turns into a dark, brown heartwood. When it no longer serves to distribute water, it hardens into the structural core of the tree, supporting it to grow wider and taller.

fig. 2.21 Chopstick Rests

Chopstick Rests

A small piece of clay punctuates the table with each pair of chopsticks. Each serves to raise the oily tip of the chopsticks off the table, to keep it free of dust, and keep the table clean from oils and food stains. While the rests aren't entirely necessary for a table setting, as the end of the chopsticks can easily be placed on top of other dishware, the presence of the chopstick rests remind diners to respect the table, keeping it free of the smallest dab of oil spills.

The simple chopstick rests are pulled into form. Clay takes on the memory of the forces that act upon them. I had initially pinched them to form the arc of the rests and smoothed them over, but when they dried, they were bumpy again. The clay shrank as unevenly as my hands had pinched it.

Like the bowls on the pottery wheel, hand-built clay pieces take on the memory of their making. Ceramic mug hands are often pulled into shape from a blunt piece of clay. The clay is elongated and shaped into a handle by stretching the clay, shaping the piece to follow the strokes of the pull. The hand that pulls is held to form the cross-section of the handle, and then runs along the length of the pull to evenly compress the piece.

To even out my lumpy chopstick rests again, I tried rehydrating the clay and smoothing the surface of the pieces along the curve of their arc to cover up the re-emerged pinch marks. After bisque firing the pieces, some of the pinch marks subtly reappeared.

fig. 2.22 Centering 1 lb. of Clay

fig. 2.23 Centering 3 lb. of Clay

fig. 2.24 Pulling a Serving Bowl

fig. 2.25 Trimming a Serving Bowl

fig. 2.26 **An Uneven Serving Bowl**

fig. 2.27 Another Uneven Serving Bowl

fig. 2.28 Serving Dish

SERVING DISHES

The *sung* in the meal, usually fish, another meat, and a variety of vegetables, is presented at the center of the table. Each *sung* is placed in its own serving dish, often presented with the sauces, oils and soups that the constituents were cooked in. The combination of dishware placed at the table varies according to the specific constituents of the meal. A soupy dish will need a deeper bowl than a long fish presented on a flat platter. Leftovers from dinner may be saved for the following day's lunch. When there is enough, it may even help replenish the next dinner's combination of *sung*.

This is where regional differences in Chinese cuisine are most apparent. My mother, whose family comes from the Guangdong region of China, usually cooks Cantonese cuisine. The Hakka food from my father's side of the family, is known for lightly cooked fresh vegetables to bring out their delicate flavours[10]. Both cuisines tend to be light and sweet with less oil than northern food.

This format of serving dinner easily lends itself to a wide variety of non-traditional shared dishes. When my brother is home, we will have Korean barbeque meat *bulgogi* (불고기) and *kimchi* (김치), which is widely available in the Asian grocery stores that my mother frequents. For a period in my childhood, my mom braised chicken wings in Coca-Cola.

10. E.N. Anderson Jr. and Marja L. Anderson, "Modern China: South," in *Food in Chinese Culture*, ed. K. C. Chang (New Haven: Yale University Press, 1977), 356.

fig. 2.29 **Tableware**

The serving bowls in the dining set are three times the weight of the rice bowls, at 3 lb. of clay. While rice bowls posed little challenge for me to center, 3 lb. begins to become more difficult for me to wrap my hands around. Unlike the small rice bowls, where I can encapsulate the clay entirely in my hands, I need to center larger amounts, one part at a time. I start at the bottom, with one hand pushing the side into center and the other supporting the top. Then, I work on the top half, being careful not to put too much pressure downward to throw the bottom off center.

The heavier amount of clay means that I have to push harder in order to center it, but when I am shaping the bowl, I need to be a lot gentler than I would be with the rice bowls. Because of its weight, centripetal force will throw the clay outwards easily at my usual working wheel speeds, so I work slowly. Every time I place my hands on the clay, I watch it make a full rotation around the wheel before adjusting my touch slightly higher up the profile of the bowl. If my hands loosen too early and I don't make contact with the full circumference of the clay, I need to wait for the spot that I had missed to come around back into my hands.

The larger profiles meant that I would need to support my pulls with a wooden kidney-shaped tool. This allows me to compress the clay against the tool as I pull so that it has more structural integrity. I am careful to use as little water as I can, since extra water is enough to weaken and collapse the bowl. It is a balance between having enough water to smoothly go over the piece, and not having enough, which will tear the clay with friction. Occasionally, if a small tear occurs, I can turn the wheel in the opposite direction and mend the tear while keeping it on center. Or, if the clay is too wet, I can let the bowl dry overnight under plastic wrap and let the clay dry out a bit so it can hold its shape. Later on, while it is still damp and malleable, I can put the bowl back on the pottery wheel to continue adjusting the shape of the profile.

fig. 2.30 An Individual Table Setting

fig. 2.31 Dipping Bowl and Chopsticks

fig. 2.32 Flattening the Plate

Plates

Small plates are used as an elevated extension of the table, shared in the middle of the table between diners, or placed with the rice bowls for each individual. During *dim sum* (點心) meals in restaurants with large tables, dishes are constantly swivelled around on a turntable. The individual plates can be used to store food in place of a rice bowl when a meal has more bread. When the dishes are consumed, the remnants of bones and shells mark a meal thoroughly enjoyed.

Because fish, crustaceans, chicken, and other meats are often served with the bones intact, the diner separates the edible parts of the meat with the food waste during the meal. Without plates, scraps would have no room to be discarded except directly on the table top. The plates mark a dignified space for the scraps to be placed.

Throwing small plates on a wheel is much easier than the bowls. In many of the steps, I can use the surface of the pottery wheel to support the clay. As always, I start by centering the clay. I use a 1 lb. ball of clay, the same as weight of the rice bowls. Because the bottom of a plate is effectively its entire surface, I open the clay to the full extent of its width. I use my thumb and a wooden rib to even out the surface and compress the bottom. The slight upturned rim is formed by pressing the edge of the clay up against the side of my thumb. When the clay is leather hard, I trim a wide foot on the plate.

fig. 2.33 Throwing Dipping Bowls Off the Hump

Dipping Bowls

Dipping bowls accompany the dishes for additional garnishes and sauces. They are usually placed with the *sung* to share, but in more formal occasions, each individual will have their own dish for sauces. Multiple sauces may be served in the same dish, and it is common for people to dip their food in more than one sauce before plating it in their own dishes. Separate dishes help prevent cross-contamination, which is especially important for people with allergies.

The dipping bowls are thrown on the pottery wheel off of what is known as a hump of clay, where many smaller pots are made from a single mass. I throw clay onto the wheel and center the top, using only part of the hump to make each dipping bowl. I press a groove into the top to separate part of the clay that I want to work with from the rest of the hump.

Then I open the small bit of clay, leaving the bottom thicker to provide support when I cut the bowl off the hump. As usual, I compress the bottom to keep the bottom from cracking when it dries, and I pull the walls up. Because it is difficult to consistently work with the same amount of clay, some of the bowls become bigger than the others. I leave the walls thicker so I can trim them to size.

When the profile of the bowl is shaped, I mark a line along the bottom with my tool and cut the bowl off with a wire. The thicker bottom allows me to hold the bowl without deforming its shape when I remove it off the hump. I set it aside and work on my next bowl. Because these dipping bowls are so small and quick to make, I end up making more than I need. Along with my extra rice bowls, I use my extra dipping bowls to test glazes.

fig. 2.34 Clear-Glazed Tableware

Glazing

After the tableware is thrown on the pottery wheel, trimmed, and bisque fired, I apply glazes for a final firing. I brush the clear glaze mix on the rim and inside of my pots to hold food, leaving the outside unglazed for the diners' hands to feel the raw clay. At a cone 6 temperature of 1222 °C, the electric kiln vitrifies the clay in my dining ware, catalyzes the geological formation of minerals into glass, and burns off all remaining organic material into dust. If underfired, the glazing will be dry to the touch. The boiling glaze will not have time to settle again and will result in a rough surface. If overfired, the glaze will be smoother and may even run off the pot onto the shelves.

Commercial glazing ingredients are often sold as raw materials to be mixed together to form a glaze. Despite the seemingly clinical purity of the ingredients, ceramic glaze application is more akin to alchemy than chemistry. As Tim Ingold describes, the qualitative behaviour of the material precedes an understanding of molecular reactions occurring within the kiln. A familiarity with how the ingredients behaves emerges from working with these materials[11]. Through experimenting with different variables, potters observe the effects of temperature, time and air quality on mineral ingredients as witnesses to a "microcosmic geology" [12] in the kiln. The potter catalyzes naturally-occurring phenomena to transmute dust into glass.

Each ingredient in a glaze acts as a flux, glass former or alumina, with many ingredients often working in multiple roles. The flux lowers the melting point of the silica and allow the other ingredients to flow into one another, and gives the glaze its surface quality in colour and texture. The glass former acts as the structure of the glaze, giving it rigidity. The alumina adheres the glaze onto the clay.

11. Ingold, *Making*, 29.
12. Hopper, *The Ceramic Spectrum,* 45.

fig. 2.35 Clear-Glazed Tableware

There may also be additive colourants or opacifiers that contribute to the glaze's surface quality[13].

I use a clear glaze with a glossy finish available at the Cambridge Center for the Arts, containing gerstley borate, flint and Edgar plastic kaolin. Like the minerals found in the clay mix, these ingredients in the glazes are from different landscapes around the world. The raw materials are mined, ground to dust, packaged and transported to consumers[14]. Over time, mines are depleted due to consumer demand, and more readily available ingredients become their substitutes. The gerstley borate in the clear glaze consists of calcium, sodium and borate[15], acting as the flux and main ingredient in the glaze. Considered to be the life blood of the glaze, it lowers the melting point of the other ingredients so they can flow into one another during the firing[16]. Gerstley borate is a common substitute for the now depleted colemanite[17]. It was extracted from California where over half of the world's boron mined was sourced[18]. Since then, the mine has closed and gerstley borate is now sold from its stockpiles[19].

The glass-forming material, silica, is the bone of the glaze whose

13. Ibid, 46.
14. Nigel Wood, "Natural Materials and their Usefulness in Glazes," in *Glazes from Natural Sources*, by Brian Sutherland (London: A&C Black Publishers, 2005), 1.
15. Hopper, *The Ceramic Spectrum*, 53.
16. Leach, *A Potter's Book*, 133.
17. Hopper, *The Ceramic Spectrum*, 53
18. Matt Katz, "Boron in Glazes," Ceramics Monthly, last modified September 2012, https://ceramicartsnetwork.org/wp-content/uploads/2008/10/TF_BoroninGlazes_0912.pdf.
19. "Chemical Composition of Gerstley Borate," Laguna Clay, last modified July 5, 2011, http://www.lagunaclay.com/support/pdf/Chemical_Composition_of_Gerstley_Borate.pdf.

fig. 2.36 **Name Stamp**

heat-resisting qualities gives the glaze its hardness and strength in the form of flint[20]. It is also found in the crystalline silica in the Tucker's mid smooth stoneware clay[21].

The alumina in the glaze is akin to the flesh which sticks the glaze to the clay body. The kaolin found in the clay itself and the Edgar plastic kaolin in the glaze work together as the alumina. The common ingredients found between the glaze and the clay fuse together to bond the glaze with the surface of the clay.

As the flesh of the glaze, the alumina melts into the glaze to give it its fatness and surface quality[22]. If the Edgar plastic kaolin is saturated in the mix, it will opacify the glaze[23]. In order to keep this glaze clear, the amount of kaolin in the mix is kept below the saturation point. This allows the trimming marks and impurities within the clay and glaze to show through.

Early Chinese ceramics commonly used ash glazes from the incombustible material in plants, which consists of minerals drawn from the soil on which the plants grew. Plant ashes are naturally rich in silica, potassium, calcium, magnesium, sodium and phosphorous, with each plant varying in composition depending on its species, growth, season, and location[24]. Ash in traditional wood-burning kilns fused directly with the clay, or onto the glazed surfaces, as the fire moving through the long 140-meter dragon kiln, picked up the ash and grazed the pots. Because less than 0.5% of the weight of most hardwoods and softwoods will burn into incombustible material,

20. Leach, 134.
21. Hopper, *The Ceramic Spectrum*, 55.
22. Ibid, 55.
23. Ibid, 146.
24. Brian Sutherland, *Glazes from Natural Sources* (London: A&C Black Publishers, 2005), 6.

fig. 2.37 Burning Scrap Wood

raw materials were burned deliberately and thrown into the kiln in order to produce enough ash to create a visible effect[25].

In contemporary electric glaze firings at a cone 6 temperature, additional fluxes are needed to lower the melting point of the ash glaze. Even with a lower ash content than a single-sourced ash glaze, the 6 kg of sawdust and wood scraps that I had collected wouldn't be enough for glazing all my dishware. If I had collected all the waste from my woodworking, I would have yielded about 3.37 kg of ash from 67.4 kg of wood waste, but without a fireplace or pit, my three buckets of sawdust were enough of a challenge to burn into ash efficiently.

Despite only producing a small amount of ash, I tested them on some extra bowls to see what my glaze could have been. After burning and sieving the dry ash, I mixed it with my glaze. I skipped the step of rinsing them, which usually removes soluble alkaline materials[26], to allow the impurities in my ash to reveal themselves in the kiln.

I was ready for whatever expression the trace amounts of ash and impurities would bring. I was anticipating a field of red or brown spots from the iron-rich soil the trees once grew from, or perhaps the iron would react with another mineral in the glaze mix to create some other earthy yellow colour. As it turned out, even with a glaze mix that was equal parts clear glaze and ash, there was be almost no change on the glaze. The only visible effects were tiny blue dots from some impurities that might been residue from another glaze on the brush.

The ash only has a visible effect if I mix it with coloured washes. A cobalt wash test shows that the ash works as a flux, melting cobalt

25. Ibid, 9.
26. Robin Hopper, "Using Wood Ash in Glazes," Ceramic Arts Network, last modified June 18, 2018, https://ceramicartsnetwork.org/pottery-making-illustrated/ceramic-supplies/ceramic-glazes-and-underglazes/using-wood-ash-glazes/#.

fig. 2.38 Clear-Glazed Bowl with Cobalt Wash

wash in the clear glaze base so that it cascades slightly down the surface of the bowl. Some of the ash falls down onto the pure, unwashed clear glaze, bringing little specks of cobalt into the middle of the test bowl.

When the pots are cooled from the glaze firing, they are ready for the table. The rocky landscape on the earth's crust was mined, ground into dust, reconstituted with water into clay and glaze, and then vitrified into a bowl-shaped rock. During dinner, the minerals that have been separated from their land are brought into the home. The new form now holds food, much of which thrived on the same minerals found in the bowl.

While pots can last for thousands of years, not all ceramic pieces survive everyday use. Even with the utmost care, a momentary swing of the arm can knock a dish off the table and shatter it. The dish can be reconstituted to a certain extent, but eventually, it begins to decay back into mineral particles. The effects of wind, rain, ice, and plant growth will weather it back into the land over time. It becomes part of the ground returning to the cycle of nature where, perhaps it will become part of soil where it will nourish new life.

FURNITURE

fig. 3.1 The Table Setting in Claude Lorrain's "Landscape with Ascanius Shooting the Stag of Sylvia"

fig. 3.2 Lumber Pith Diagram

fig. 3.3 Rough Cut Diagram

fig. 3.4 Dresden, Ontario

The dishware is set on a table made of North American black walnut, *juglans nigra*, a hardwood species typically used for cabinetry and furniture. It is unique to southern Ontario, in the warmest region of the province[1]. Black walnut trees commonly grow throughout the eastern United States and reach the extent of their northern range along Lakes Ontario, Erie and St. Clair.

The black walnut prefers well-drained soil with roughly equal parts sand, silt and clay. This soil is typically brown, reddish brown or yellowish brown[2], the same colour hues as the black walnut wood. In ideal conditions, the trees are planted in backyards, cultivated in orchards and thrive naturally in the wild, usually growing to 90' in height and over 24" in diameter in 30 years[3]. The roots are known to excrete juglone, which is toxic to many susceptible plants, making it difficult to grow other species under its canopy.

This hostile species is the wood in my furniture. The table and chairs now serve as host, bringing guests together over dinner, welcoming them to a space of conviviality. As the furniture maker, I use the materials in the land to create the space for the event. As the dinner host and cook, I use the ingredients of the land to feed guests at the table. In addition to nourishing the body, food invites strangers into a relationship between friends[4].

1. E. J. Mullins and T. S. McKnight, eds, *Canadian Woods: Their Properties and Uses*, 3rd ed. (Toronto: University of Toronto Press, 1981), 38.
2. Felix Ponder Jr., "Characteristics of Good Growing Sites for Black Walnut," USDA Forest Service, last modified 1998, https://www.ncrs.fs.fed.us/pubs/misc/walnut/p38_43.pdf.
3. Mullins and McKnight, *Canadian Woods: Their Properties and Uses*, 38.
4. Leininger, "Some Cross-Cultural Universal and Non-Universal Functions, Beliefs, and Practices of Food," *Dimensions of Nutrition*, 155.

fig. 3.5 Dresden, Ontario

I bought the black walnut wood for my furniture on Kijiji from a man who logs bush and backyard trees as a side job. He sources his lumber from homeowners in southern Ontario within a three-hour drive from Dresden, Ontario. With few exceptions, he will pay homeowners to remove any fallen maple, black walnut or cherry trees over 20" in diameter.

The original Kijiji posting had a 450 board feet stack of 2" thick black walnut wood at about half the price of what I would normally find in the Kitchener-Waterloo area. He was trying to sell all of the lumber to a single buyer at a bulk price. This would have been almost four times the amount of wood that I needed. When he agreed to sell me 120 board feet at the same rate, I asked a friend to drive me to Dresden and agreed to meet with the seller that weekend.

I don't really know why I felt urgent about going. Before I saw the Kijiji posting, I wasn't even sure if I wanted to make the furniture out of black walnut. The conventional approach would have been to use a blonde hardwood species, such as white ash or yellow birch, which tends to be half the cost of black walnut in most retailers around the Kitchener-Waterloo region. Blonde woods feel domestic and modestly utilitarian. The clear figure-ground relationship between the surface of the table and the individual pieces of tableware would be comfortably familiar in a table setting. The hardness of a species like hard maple or white oak could also endure years of nicks and dents. Almost any blonde hardwood native to southern Ontario would have been a pragmatic choice.

I used the set of black walnut bowls and chopsticks that I had already made to imagine the surface of the table on some small panels of wood. The pieces immediately felt more dignified on the black walnut, as if they were emerging from the same matter.

Before seeing the Kijiji post, my hesitation about working with it came from its expensive cost. An entire dining set immersed in the dark timber felt indulgent compared to the cheap MDF furniture I was used to. An intense dark table surface, typical of a more expensive hardwood, could also establish a heavy-handedly austere

fig. 3.6 Dresden, Ontario

setting. The light colour of a blonde species would feel gentler.

I was almost set on using a blonde species until I saw that the Kijiji posting for black walnut matched the cost of the other contenders. It's hard to say if my curiosity was piqued because the satisfaction of hunting down a good deal produces a very compelling high, or because I had a subconscious desire that was, until now, hindered by financial constraints. I was alternating between choosing black walnut and various species of blonde hardwoods for so long that it was hard to discern what I wanted anymore.

Impulsively, I equipped myself with the school's resistance moisture meter to make sure the wood was dry enough to work with and left for Dresden. Since I wasn't buying his entire stock as he had advertised, we agreed that I could only take the smaller slabs. When I arrived, I scanned for those with the fewest knots and avoided the pieces with two live edges since I figured I would have to cut them away eventually.

I later learned that most of the slabs that I had picked up came from the same couple of trees. The trees were cut, air-dried to a moisture content of about 25% and then dried further in a conventional kiln to about 8% before it was sold. This was a rare luxury in the Kitchener-Waterloo area, where it was difficult to buy large quantities from a single source, and most retailers sold kiln-dried wood, which tends to yellow the sapwood.

The wood sat in storage for almost half a year before I made my first cut. It needed some time to climatize to the humidity of its new environment, but it certainly didn't need six months to adjust from an indoor climate-controlled environment to another indoor environment. I was just nervous to cut into it with my limited woodworking experience. In a slow, productive way, delaying the inevitable, I spent those months on refining the designs and practicing my joinery.

Until then, I had only worked on small woodworking projects. My work grew from soup bowls that fit in the palm of my hands,

fig. 3.7 Stack of Black Walnut Slabs

to full-sized furniture, carrying the weight of my body and withstanding daily wear. I barely knew how to make wood joints, and my unsuccessful attempts were all made using scraps of wood I found in offcut bins around the school workshop. I was a scavenger, working with leftovers gleamed from other students' projects, and now I had my own large slabs wood to ruin.

After the tree fell somewhere in southern Ontario, there was nothing anyone could do to restore it to life. Once the wood was in my hands, I could only break it down into smaller pieces, throw away the remnants of its past-life, and rearrange it into a different form.

fig. 3.8 **My Chair**

DINING CHAIRS

Hannah Arendt writes that when we work with our hands to make objects, we create a tangible manifestation of the human experience. While chairs come in different forms, humankind is united in its use of the chair[5]. The presence of a chair marks a place for someone to sit in the group. They welcome diners to the table long before the dishes are set. The chairs honour each individual participating in the event, dignifying each person with a seat at the table. It is an invitation to be heard and contribute to a conversation. After dinner is finished, the chairs and the used tableware remain at the table as a ghost of each person who was present.

The chairs at my table are made with solid wood to express the weight of the seat. The legs run continuously along the back of the chair, clear of horizontal members under the seat, which tend to restrict leg movement. The seats of the chairs are generously wide with a carved saddle to evoke the impression of the human body, inviting people to sit. The slightly reclined angle of the chair invites people to relax and stay. The back of the chair curves to cradle the diner without fully enveloping him, isolating him from his neighbours. Drawing from these instincts for how I wanted the chairs to feel, I began my journey in chair making, drawing first on the computer.

5. Arendt, *The Human Condition,* 137.

fig. 3.9 Nakashima Woodworkers Stick-Back Lounge Chair

fig. 3.10 Shaker Ladder-Back Side Chairs

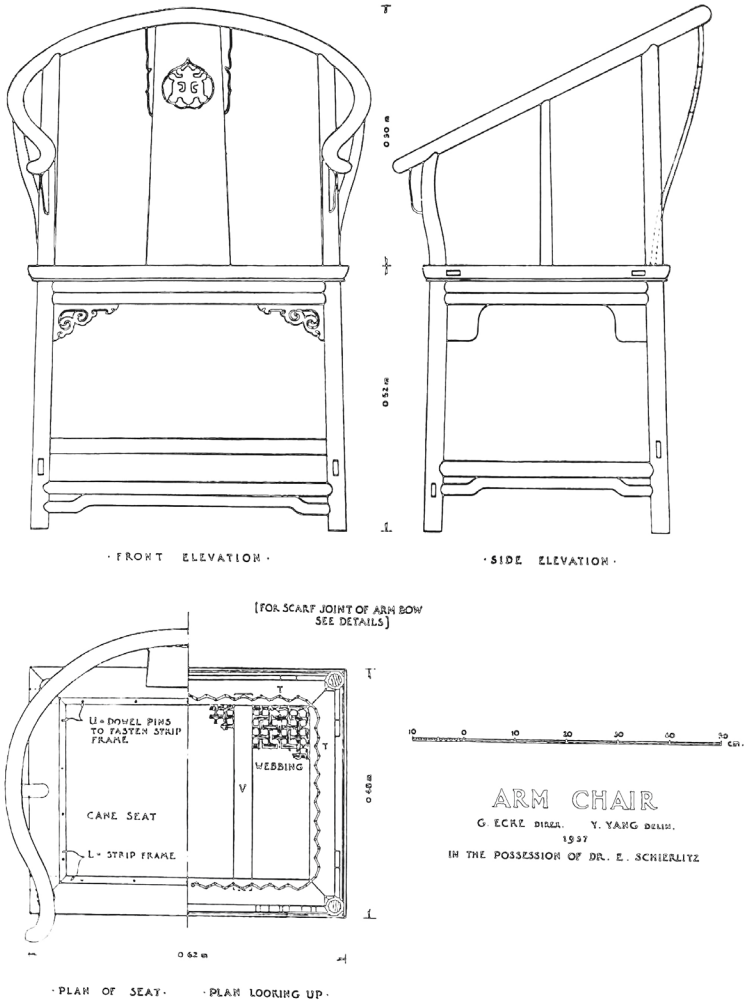


fig. 3.11 Ming Dynasty Arm Chair

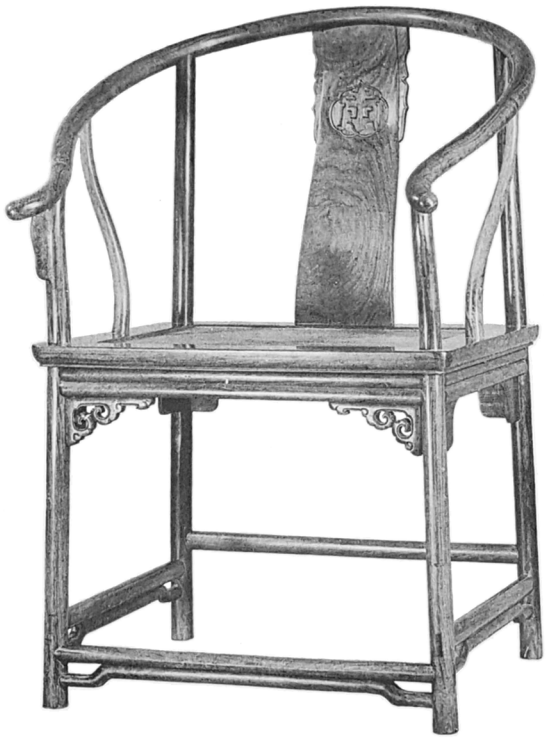


fig. 3.12 Ming Dynasty Arm Chair

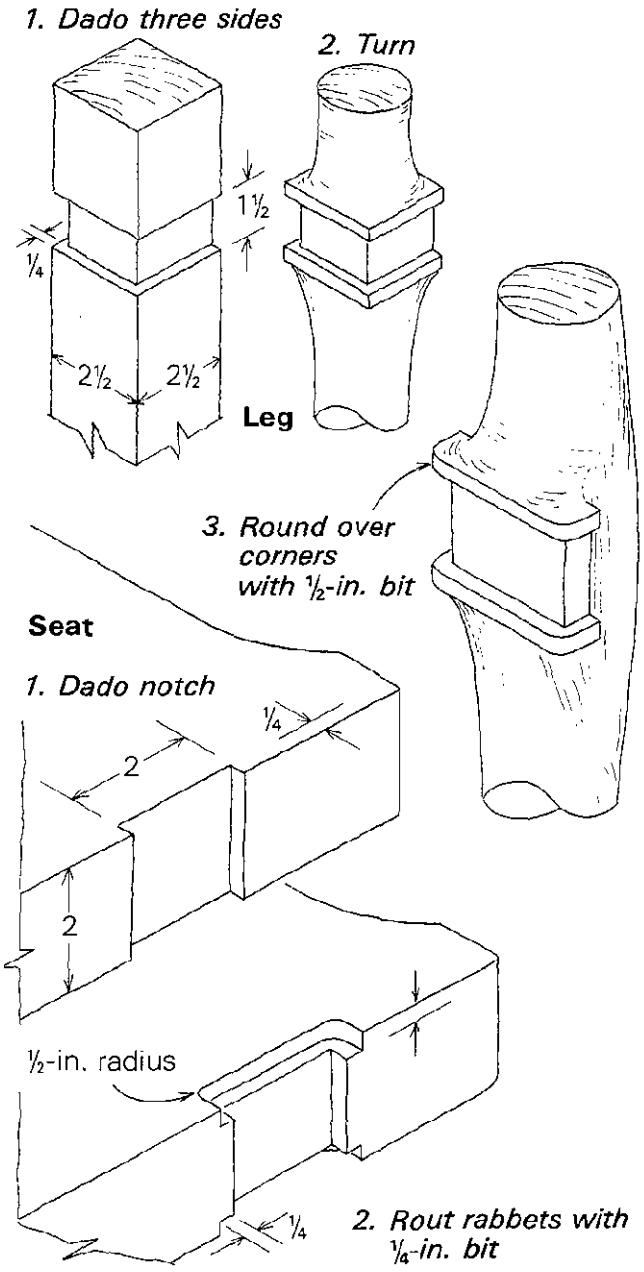


fig. 3.13 Sam Maloof Joint

fig. 3.14 Sam Maloof Rocking Chair

fig. 3.15 Chair Joint

fig. 3.16 Chair Leg

fig. 3.17 Fitting the Chair Joints

The Joints

Compared to the clay thrown on a pottery wheel, furniture making requires planning and dimensioning so that the pieces come together to form a chair. Every panel of wood is measured and squared in reference to one another. The joinery needs to be cautiously cut in order to fit without being too loose. The thickness of a seat is carefully considered so that it can fit into the legs. Even the curved backrest must find its way back into fitting with the orthogonal parts of the chair.

Wood furniture is traditionally made with mortise and tenon joints. Stick-back chairs, like the Windsor chair, are made of round tenons pinned into a mortised solid wood seat. The legs are splayed outwards from the underside of the seat. The back is made from bent wood and an array of spindles. The same joint is used multiple times to connect each part in the chair.

The Shakers used square mortise and tenon joints to create a frame that supports a seat made with thin panelled wood or woven cord. The wooden frame acts as a truss distributing the forces of everyday use throughout each member. The legs act as vertical members that support the corners of the truss and extend up the length of the chair to support horizontal members for the back. Stretchers run horizontally under the seat to give additional support to the legs. They form a sturdy frame from small members of wood with an economic use of materials.

Elaborate forms of mortise and tenon joints were also found in Ming and Ching dynasty official's hat armchairs, similar to the ones found in the post-and-beam wooden structure of temples and palaces. The legs and arms connect to a frame for the seat which house a woven seat or wooden panels connected tongue and groove joints. Ching dynasty chairs had particularly elaborate carvings that would slot into the vertical members to embellish and provide additional support at the corners.

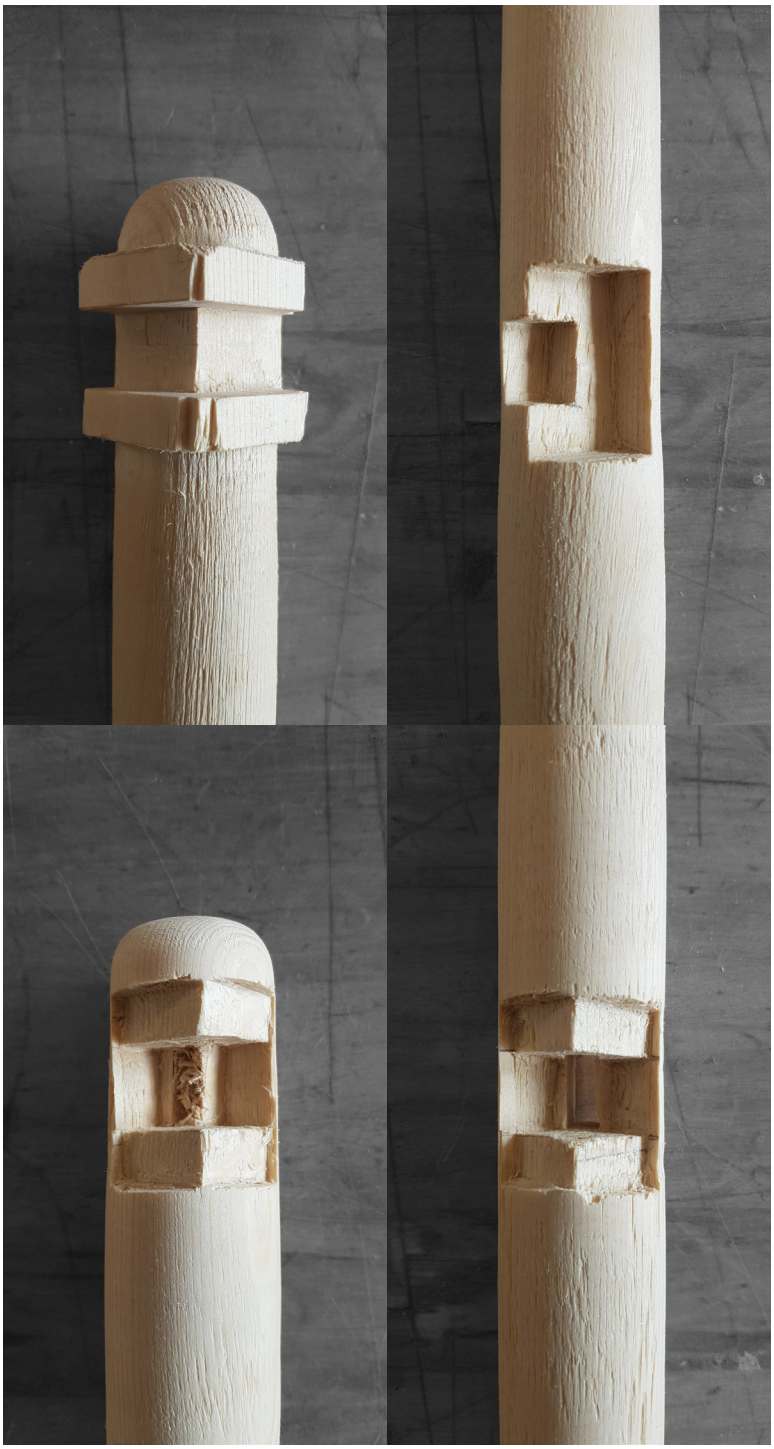


fig. 3.18 Prototype Leg Joints

I made full-scale prototype joint connections using scraps of dimension lumber found behind the workshop to understand how to build the chair. Many of them were either too small or too warped for larger projects. The abundance of material made it easy to play with different techniques being overly cautious about how much wood I was using. I could try out as many joints as I wanted without wasting a good piece of wood. I focused on making one joint at a time, developing each piece.

Since my drawings didn't follow traditional joinery construction, I needed to develop my own joints. A stick-back construction wouldn't allow the legs to sit in the corners of the seat, and a mortise and tenon frame required a fussy number of members to support the legs under the seat. After approaching him with my predicament, Dan, the school workshop technician, introduced me to Sam Maloof's dado and rabbet joints, which allowed the legs to be attached to the corners of a solid wood seat with strong moment connections.

To create a more subtle connection between the legs and seat, I hid the rabbet and dado joint in a blind connection so that the dado joint doesn't run through the entire depth of the leg. I cut the prototypes of the hidden dado joints in the legs with the milling machine and cut the rabbets in the seat with the table saw and router. The legs are pegged into the backrest to create more surface area for glue. I used 3D printed models at a 1:10 scale to study the proportions of the chair and imagine the joints in relationship to the whole design.

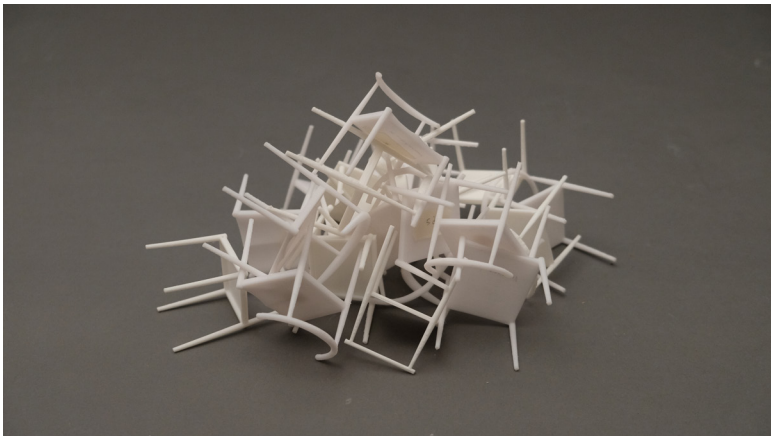


fig. 3.19 Plastic 3D Printed Chairs

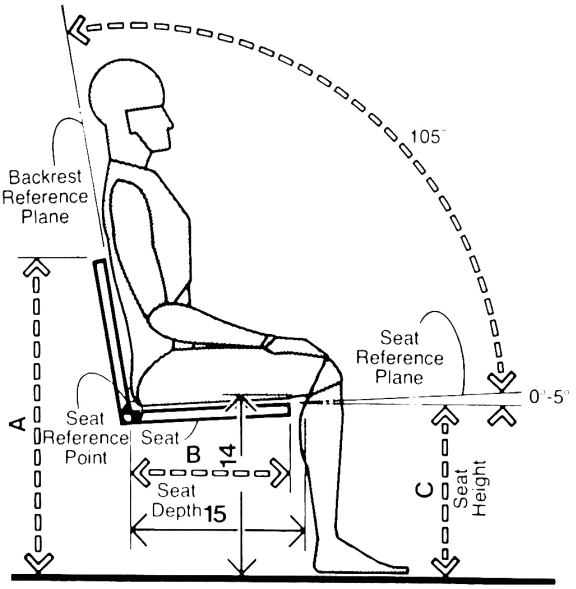
fig. 3.20 Plastic 3D Printed Chairs

fig. 3.21 Prototype Seat Joint

fig. 3.22 Full-Scale Chair Prototype

fig. 3.23 Legs on CNC Jig

fig. 3.24 **Leg Joints**



	in	cm
A	31–33	78.7–83.8
B	15.5–16	39.4–40.6
C	16–17	40.6–43.2
D	17–24	43.2–61.0
E	0–6	0.0–15.2
F	15.5–18	39.4–45.7
G	8–10	20.3–25.4
H	12	30.5
I	18–20	45.7–50.8
J	24–28	61.0–71.1
K	23–29	58.4–73.7

fig. 3.25 Dimensions of General Purpose Chair

The Body

As I make prototypes of the joinery, I constantly compare it to my own body, using the full-scale prototype of the back of the chair. I sit on the edge of the seat, lean on the backrest and imagine the rest of the chair. I can feel how low to the ground I am sitting and how my body conforms to the backrest. Doing so, I compare what looks comfortable in my drawings with what feels comfortable as I rest on my built prototype.

I eventually make a prototype of the entire chair out of yellow poplar wood, with a full seat, four legs, and a backrest. I work through each step of paneling the wood, cutting the joints, turning the legs and carving the back. It allows me to practice my woodworking skills while also understanding how the chair feels in relation to my body.

In *Human Dimension and Interior* Space, Julius Panero and Martin Zelnik use a more quantitative approach to inform designers about average dimensions of the human body. Human comfort settles into a range of dimensions that work for 90% of the surveyed population. This simplifies furniture design into a parametric exercise, working within specified dimensions.

According to Panero and Zelnik, the most important measurements for human comfort in a chair are the popliteal height (to determine the height of the seat), the buttock-popliteal length (to determine the depth of the seat), and the lumbar region (for the backrest)[6]. If the seat is too high and the seated person is unable to rest their feet flat on the floor, the edge of the chair will compress the underside of their thigh. If the seat is too low, one may need to constrict their knees to allow their feet to rest on the ground, or extend their legs and forfeit the stability that their feet provide.

6. Julius Panero, and Martin Zelnik, *Human Dimension and Interior Space: A Source Book of Design Reference Standards* (New York: Whitney Library of Design, 1979), 127.

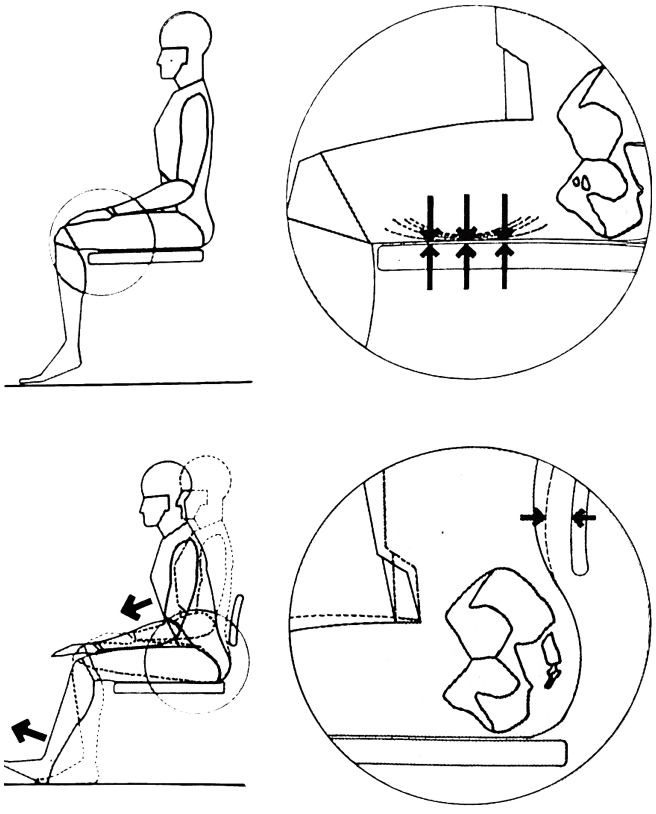


fig. 3.26 Seat Height Diagram

My chair seats have a popliteal height of 17.5" and 16.5" because I have not yet decided what height I would like to keep the set at. While it is common to find commercial chairs with 17.5" seat heights, these chairs only accommodate the average man and the tallest 95th percentile of women[7]. It is only a good fit when sitters are wearing shoes, which elevate the feet higher and elongate their natural popliteal height. For most women, this would mean having to wear shoes with at least 1" thick soles or high-heeled shoes.

At a popliteal height of 17.5", the chairs feel grand for most people accustomed to furniture in North America. They aren't unexpectedly tall, but when they aren't wearing shoes, it isn't an ergonomic fit either. At 16.5", the shorter chairs allow most people to sit with their feet flat on the floor, but feel unexpectedly low compared to other chairs they are used to.

The seat height of a chair may seem like a strange thing to fuss over. Of all the anthropomorphic measurements that inform the proportions of a chair, the popliteal height is the most varied, which makes it a mildly contentious area of chair design. It is the first dimension that the body feels when it sits down. I never noticed the comfort of a good sitting height until I visited George Nakashima Woodworkers Studio. Since I was visiting to see the furniture, I was more cognisant of how each piece that I sat in felt. When I sat in a low Conoid lounge chair, the first thing I noticed was how unusual it felt to be sitting so low as other visitors were towering over me. Not long after that, I realized how comfortable I felt regardless of my odd position. I had never noticed how rare it was for me to sit in a chair without my feet dangling. I could stretch out my legs, and they would still be firmly supported.

It is difficult to tailor furniture to each individual. Even if the chairs could be made for different sizes of people, the table shared between all of them will inevitably put them in an awkward position, with some people sitting too low relative to the tabletop

7. Ibid, 61.

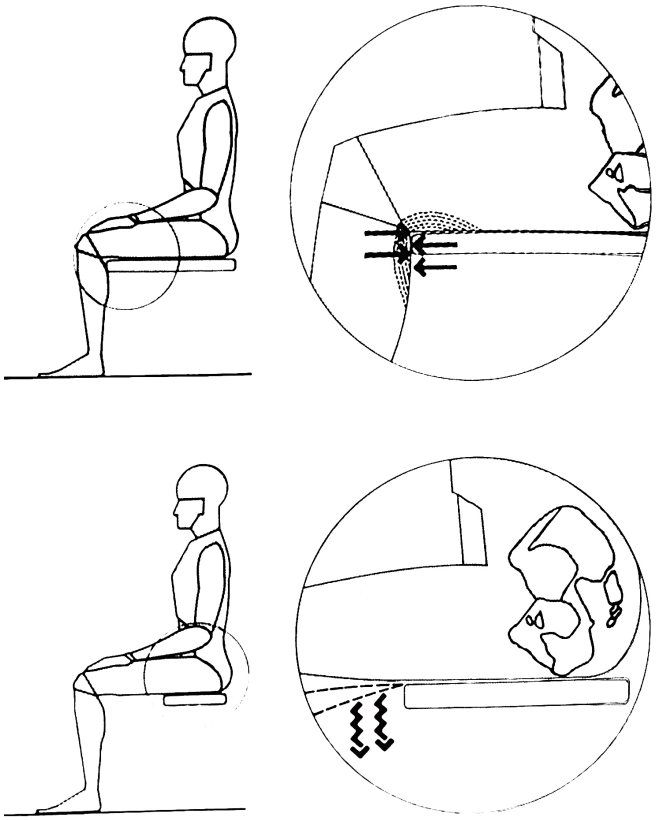


fig. 3.27 Seat Depth Diagram

and others sitting too high. As someone with a popliteal height of about 16", it would be rare for me to find a comfortable chair that won't feel too low and lazy for others. I've left the chairs at varying heights for now, saving the offcuts of the shorter chairs in case I need to glue them back on to extend the heights later.

The other critical dimensions of chair design, such as the range of buttock to popliteal length, are more similar between men and women, which makes them easier accommodate. A seat that is too deep with a long buttock-popliteal length will compress the back off the knees to reduce blood flow in the legs while a shallow seat will not provide enough support for the user. Generally speaking, people with shorter legs will find larger chairs pinch their legs while taller people will have a hard time stabilizing themselves in smaller chairs. My chair is 17" deep, which is shallow enough to stand up comfortably without dragging chair back, and deep enough to lounge in, rather than just sit on edge.

Anthropometric studies are less specific about dimensions for the back of a chair. It is recognized as a critical part of the chair, helping a person stabilize themselves in various positions on the chair[8]. However, the complexity of designing for the curvature of the back makes it especially difficult to quantify. It is general advised to provide support for the lumbar region[9] but there is not much information beyond that.

I ask friends of different heights and weights to sit in my prototypes. I ask them to take off their shoes so that they can sit in the chair with the natural length of their legs resting on the floor, as if they were sitting in a chair at home. It helps me understand how people of a diverse range of sizes feel when sitting in my chair. A friend who can articulate where and why they are uncomfortable provides more nuanced feedback than a table of numerical

8. Ibid., 60.
9. Ibid., 66.

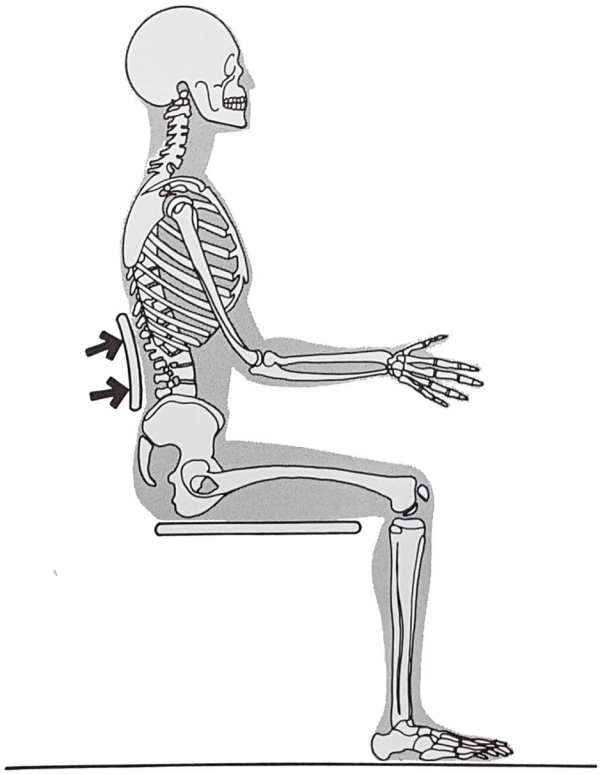


fig. 3.28 Backrest Diagram

dimensions.

I try a prototype and adjust to widen the seat, tilt the backrest more, and lower the sitting height. In an effort to relax the saddle of the seat, I keep the saddle fairly shallow. An overly articulated saddle may restrict the amount of positions a person can sit in or discourage a friendly cat from sitting with their human companions at the table. The perky legs tilt the seat into the embrace of the backrest. It gently supports the shoulders without restricting them, and begins to extend a rest for the elbows and arms.

While the anthropometric studies provide good guidelines for beginning to think about the proportions of a chair, the way humans experience sitting in a chair is dynamic. For one, people adjust themselves to sit in difficult positions according to their social situation. When eating, a diner would sit upright closer to the table and the food. Towards the end of the meal, they might lean back to relax and indulge in conversation.

Even before they sit in a chair to experience its tactile qualities, a person is preconsciously experiencing its haptic qualities. Before they touch it, it invites someone to sit and stay. A carved saddle suggests a place to sit, made specifically for the viewer. It inscribes a spot that will cradle their bum and legs. A person can see that they wouldn't lounge on the hard wood but they can sit upright comfortably.

fig. 3.29 Oiled Backrest

fig. 3.30 Chair Seat

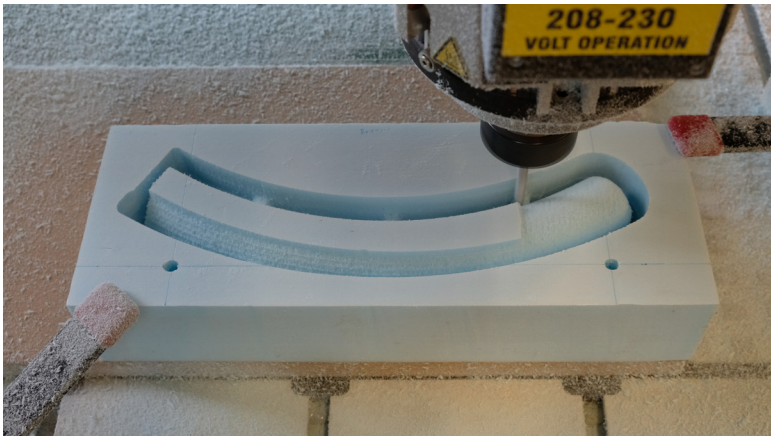


fig. 3.31 Milling Backrest Prototype

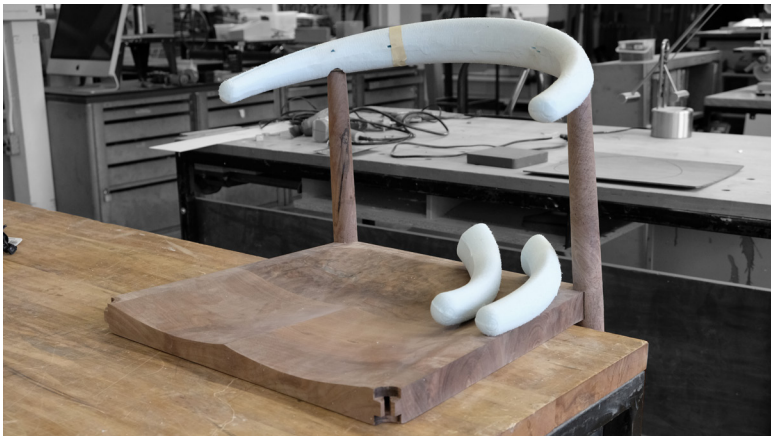


fig. 3.32 Backrest Prototype

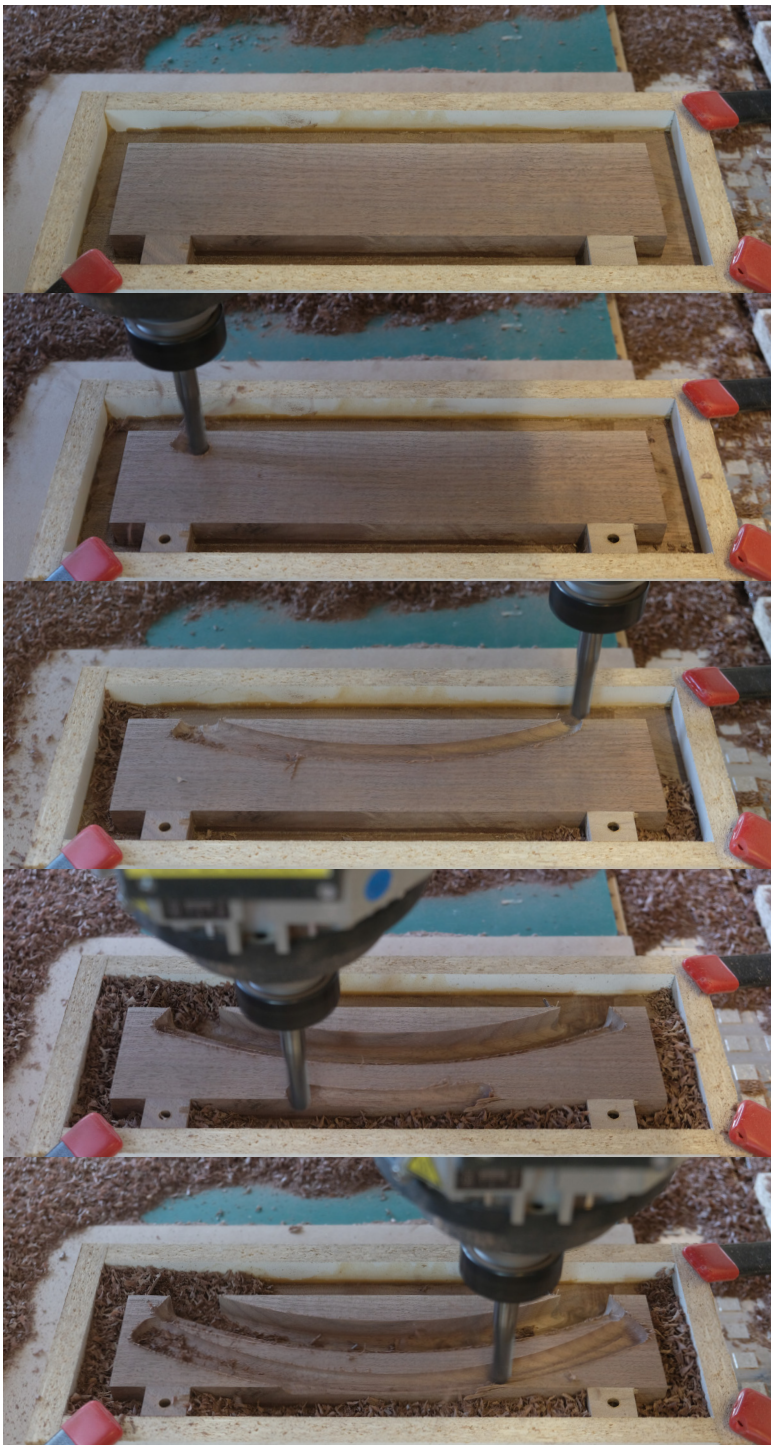


fig. 3.33 Roughing the Top of a Backrest

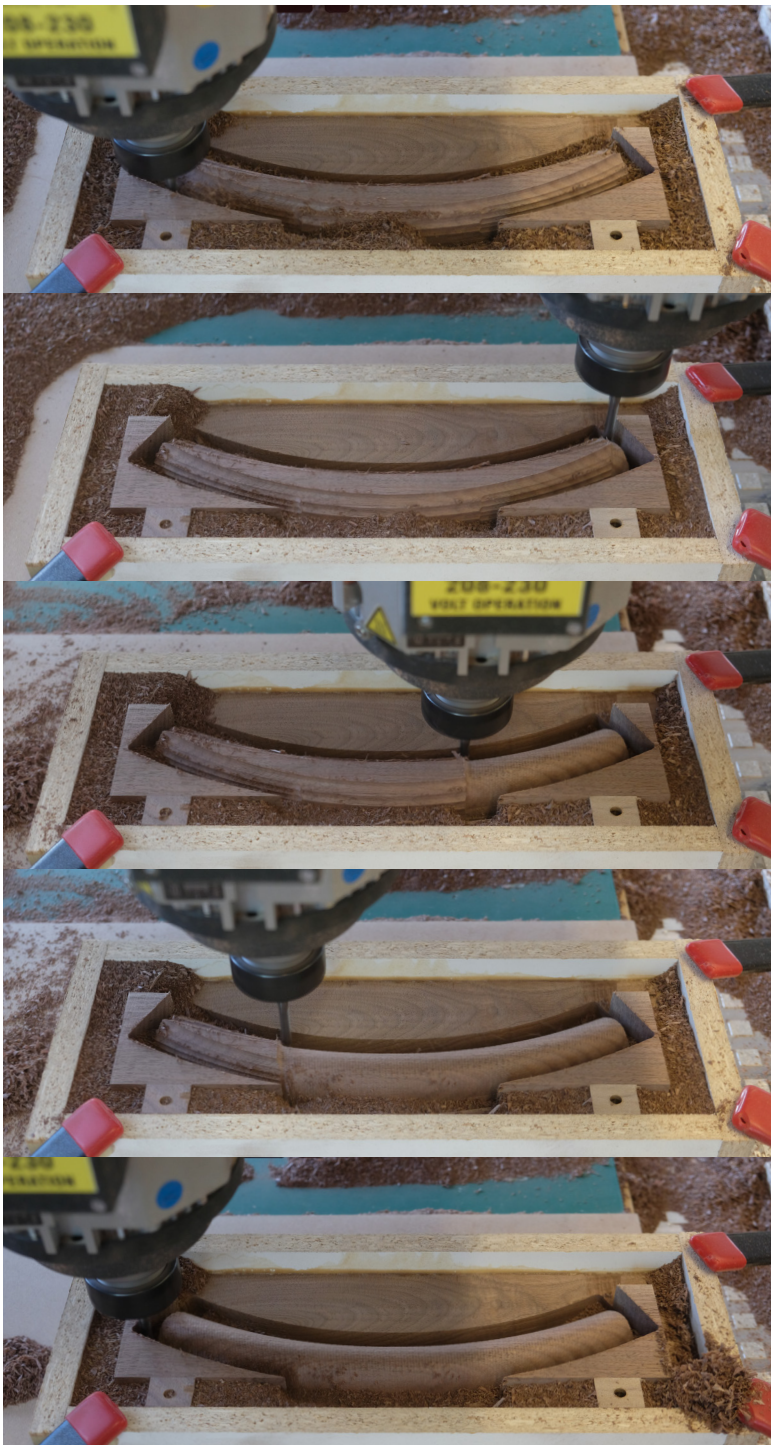


fig. 3.34 Finishing the Top of a Backrest

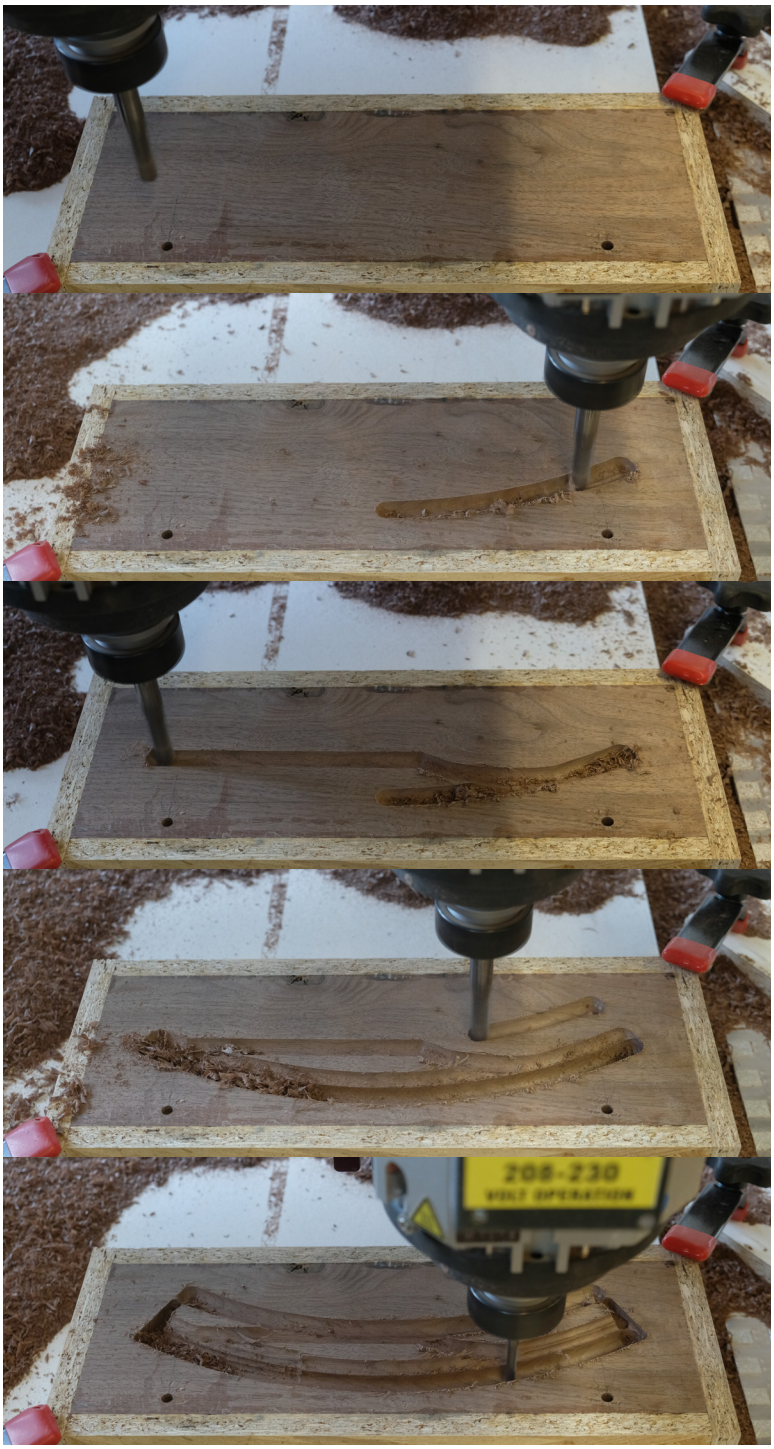


fig. 3.35 Roughing the Bottom of a Backrest

Machining Multiples

The biggest challenge in my endeavour to make a dining set is making multiples of each item. On top of that, I had foolishly decided that I would make six of everything, when I could have just settled for four. In this regard, the Computer Numerical Control (CNC) machine was essential to efficiently making a consistent set.

I used it first for the leg joints, which were a nightmare to cut by hand. Even with the help of a drill press and milling machine, it took me an entire day to fit a single joint on my earliest prototypes. With the CNC machine, I could cut each joint in 15 minutes. I was also able to introduce a curved geometry in the leg joint, which saved an extra step in chiselling the mating joints on the seat.

Unfortunately, not long after I finished machining all the leg joints, there was a fire in the school workshop. While my wood was safe from fire damage, the sprinklers had flooded the floors and filled the air with moisture. Soon after that, the university plant operations worked quickly to dehumidify the workshop to save the workshop's wooden floors. Thankfully, my lumber remained dry on elevated shelves, but the sudden changes in humidity made the wood swell just enough to no longer fit into the seats. After programing the machine, setting up a custom jig, and then having to readjust all the joints with a chisel, it's hard to say if I actually saved any time by machining the leg joints. At least, for the most part, it helped with making the other parts of the chair.

I used the CNC machine to carve iterations of the chair seats and backrests. With little access to larger carving tools and no patience for carving an entire chair with a whittling knife, I programmed the machine to cut a few versions of my pieces. I tested full-scale seat saddles and backrest shapes on extruded polystyrene foam. Once I was satisfied, I ran the same program to mill the wood.

The shallow carving on the seat was straight-forward to cut, but the backrest, which had a height that exceeded the size of my

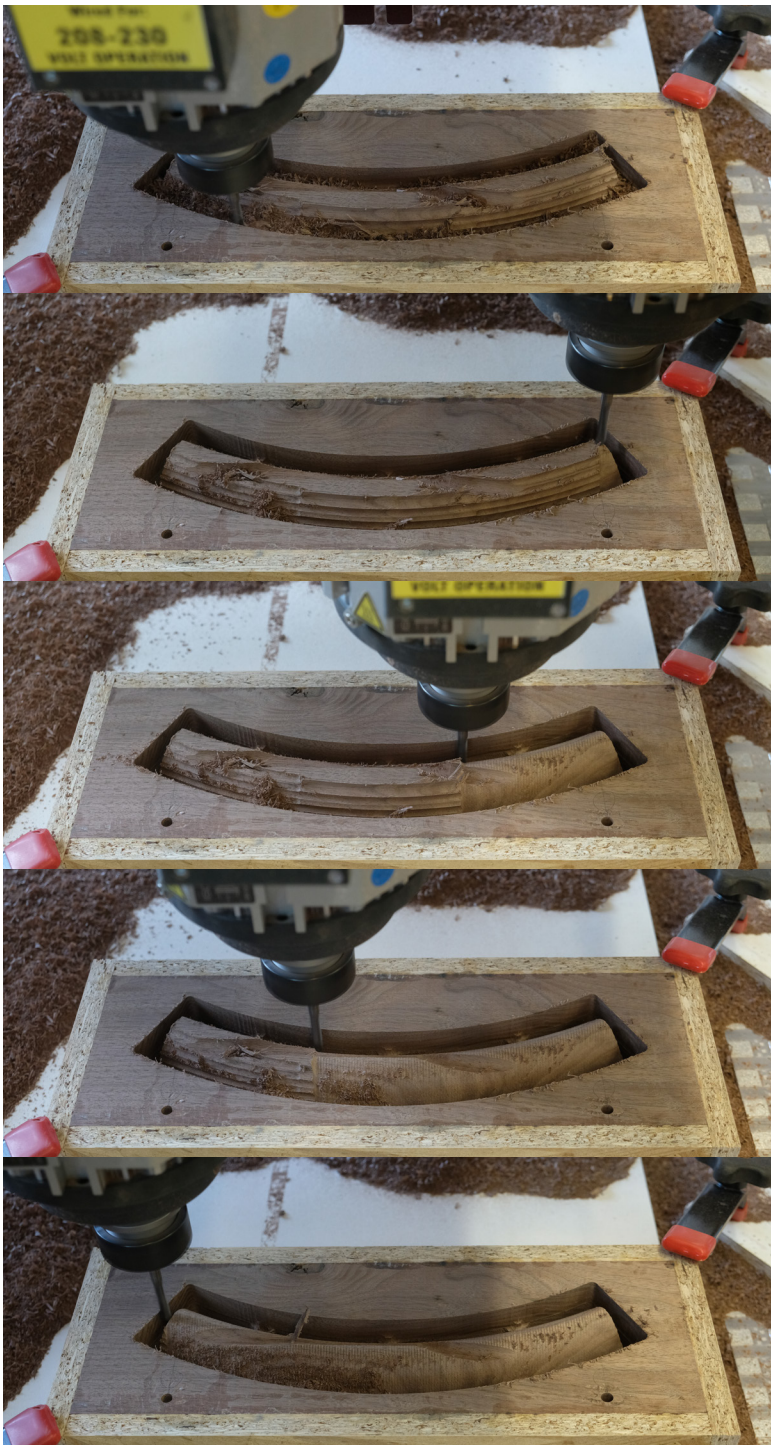


fig. 3.36 Finishing the Bottom of a Backrest

lumber stock, required a bit of orchestrating. Because I didn't have enough wood to build a solid block for each part, I had to glue multiple pieces of wood to form a rough contour of the backrest. Each part of the milling blank was carefully measured and cut from the rough wood to have as little waste as possible.

I built a frame around the blank so that I could flip it upside-down to mill the top and bottom of the backrest. By the time I was cutting my fourth backrest, I had an efficient system of cutting the pieces. The CNC machine would drill two holes in a piece of scrap wood that I used as a spoil board. Then, I put pegs in the holes to set my blanks on. The machine would cut the top of the backrest, then drill two holes on the top so that I can position the backrest upside-down in the pegs. This way, the top and the bottom of the backrest would be precisely aligned for each cut.

No matter how much I tried to control every step of the fabrication process, the machines occasionally behaved in unpredictable ways. When I thought I had the perfect set up, the machine decided to run amok outside of its program to gouge out a part of the backrest by its own volition.

After starting to mill one backrest, I had paused the machine to tighten the clamps. As normal, the machine raised its tool and stopped it spindle. When I continued the cut, it decided to cut through my backrest, rather than following the program and continuing from where it had left off. It eventually found its way back to the program and continued milling the rest of the part as if nothing had gone wrong.

At that point, I had no more wood to make a new blank, and even if I did, the grain pattern in the new part would no longer align with the other two parts in the same backrest. After it was finished milling, I resolved to patch the gouge with the help of photogrammetry technology. Using hundreds of photos from every angle of the piece, I recreated a 3D model of the gouge.

With this information, I modelled the negative to make a patch.

fig. 3.37 Backrest Plug and Gouge

I programmed the same machine that destroyed my piece to fix the damage that it had done. While I would like to say that the machine had completed its own process of redemption, I later learned that it had also gouged out parts of my colleague's projects after they had paused and continued their work. The button that we had innocently thought meant to "resume" the program, occasionally set out to "destroy".

Once all the parts of the backrest were milled, I distanced myself from the CNC machine. I cut the backrest connections to the legs on the milling machine, I glued the three backrest parts together with clamps, and then I sanded assemblies to smooth over the CNC milling marks.

After all the work that I had done to mill my backrests exactly as I had drawn them on the computer, I realized when I ran my hands along the backrest, my hands would get snagged in the short, wide ends. Despite the backrest having the same thickness throughout its form, the backrest looked and felt awkward with the bulbous ends. The CNC machine carved the exact same geometry in the wood as my foam prototypes, but something, maybe the weight or the colour, wasn't translating well to the dark hardwood. So, despite what I thought was enough prototyping to avoid having to carve by hand, I ended up sculpting my backrest by hand anyway. At least, if the opportunity ever arises, I'll be ready to fabricate a seventh chair with a better-fitted set of legs, seat and back.

fig. 3.38 Right Backrest Arm After Milling

fig. 3.39 Right Backrest Arm Before Sanding

fig. 3.40 Middle Backrest Part After Milling

fig. 3.41 Middle Backrest Part Before Sanding

fig. 3.42 Left Backrest Arm After Milling

fig. 3.43 Backrest Before Sanding

fig. 3.44 Oiled Seat

While I've patched over the gouges from the CNC machine, each cut in the wood cannot be truly undone. There are patches throughout the furniture to cover up accidents and mistakes during the process of fabrication. Every part of the chair embodies its past, including the grain in the wood which communicates the character of the tree it came from. Each panel of wood shows the growth and weathering of the tree. One can see how the tree twisted to adjust itself to the sun. A knot is evidence of where a branch grew. Each piece is unique to the moment of growth in the tree.

If I had been more attentive when buying my wood in Dresden, I would have realized that I was picking wood from the same two trees and a couple of solitary slabs. One of the individual slabs had a beautiful figuring pattern across the top of the slab. Little pieces of bark spot one side of the slab where the tree had grown over its outer skin. If it wasn't for the figuring, I wouldn't have bothered to pick this piece up. There was a large crack at the bottom of the slab, which I would have to work around.

The irregular wood pattern seems to suggests this slab was sliced near a tree fork[10]. The tilting grain pattern and slight sliver of pith emerging through the thickness of the slab tells us that the tree was growing diagonally near the top of the slab. The figuring pattern is probably the biggest clue of where it came from. This intertwining pattern results when the layers of wood around the branches in a tree fork grow into one another. The layers push back and forth into one another, fighting for the space between them as they look for room to expand from the pith of the branch. Over time, the resulting grain grows in a fluid pattern as the forces of both branches give and receive space to grow from the other branch.

10. A.J. Panshin, Carl De Zeeuw, and Harry Philip Brown, *Textbook of Wood Technology* (New York: McGraw-Hill Book Company, 1964), 248.

fig. 3.45 Unfinished Seat

Oddly enough, the sapwood in this slab grew in a rippling texture along the length of the slab which intensified near the top.

The other lonely slab, the last piece I picked up, was cut across the width of the tree from edge to edge. It had a large portion of sapwood on both sides, with more sapwood closer to the top of where the tree grew, where the sapwood moves more. As the tree grows and branches off toward better light over the seasons, it leaves trails of sapwood behind. These two slabs were cut to make the seats for the chairs.

As I was attempting to get more work done in the shop before the Christmas holiday, I cut the seats into 3" to 4" panels without much thought. Following conventional wisdom, I wanted to make a more stable seat with smaller pieces by alternating the wood grain. This allows all the pieces warping in one direction to be offset by the pieces warping in the opposite direction. The smaller panel size minimizes the warping from each individual piece and reduces the overall warping in the seat when they are glued together. I cut around the knots to get good clear wood for my seats.

Cutting lumber is like butchering an animal. The more you cut out and throw away, the more flavour is lost. In our North American diet, we tend to prefer specific cuts of meat: the chicken breast, the beef sirloin or ribs. The other parts of an animal that make it recognizable as a living being, like the neck, the legs and the face, are thrown away or ground into a homogenous paste for manufactured products like chicken nuggets. The relationship to the animals that are consumed become more distanced with each manufactured step.

In the same way, woodworkers cut out the characteristic parts of a tree that are usually considered defective. These are the knots that reveal where the branches have grown, or cracks that reveal glimpses into the drying process. These parts are less stable and pose a risk to the structure of otherwise clear, straight grain. In the same way, I cut out the large knots and cracks in the wood.

This is the logic that results in engineering entire trees into

fig. 3.46 Unfinished Seat

thin layers of plywood to make them more stable than natural solid wood. At a certain point in the process, the wood is so segmented that it no longer resembles the tree. While I wasn't cutting the panels into tiny slivers of plywood yet, the form of the tree was still trimmed away with every cut I made. Each cut from the bandsaw meant having to join two more sides, effectively pulverizing about 1/4" of the wood into dust in the process of dressing it. If the pieces were glued together again, there would be an obvious seam where the wood is missing from the cut. The grain no longer matches perfectly.

At the time, I wasn't thinking much about the natural form of the tree. The slabs of wood that I was working with was a piece of nameless material with a limited yield. It had defects that I had to cut around and I had a plan to outwit it to make uniform, stable chair seats. Newly trained in using the skill saw, I was mostly concerned about cutting along the lines I measured out. My eye ignored the beautiful wood grain before me and focused on the lines that I needed to follow to get the job done. In my efforts, I had divided the natural figuring of one slab into four irreconcilable pieces. The cracks in the wood from the drying process, which could have been somewhat preserved with some reinforcing inlays, were cut out completely to avoid hassle. And rather than working with the character of the knots, I cut around them to obtain clear, pristine pieces.

What I should have done was to try to make my seats with as few strategic cuts as possible, positioning the cuts to include the knots, cracks and defects in the wood that give each piece of the tree its unique character. Each seat is a picture of the tree's growth across a section of the trunk. I should have left each cross-section of the tree as wide as possible. In the end, I matched the rough-cut panels to resemble, as much as possible, the original grain pattern in the lumber.

Despite no longer living, the wood in the seats continue to breathe as it expands and shrinks with the moisture in its environment. The chairs are designed for the seats to move without being restricted. I'm

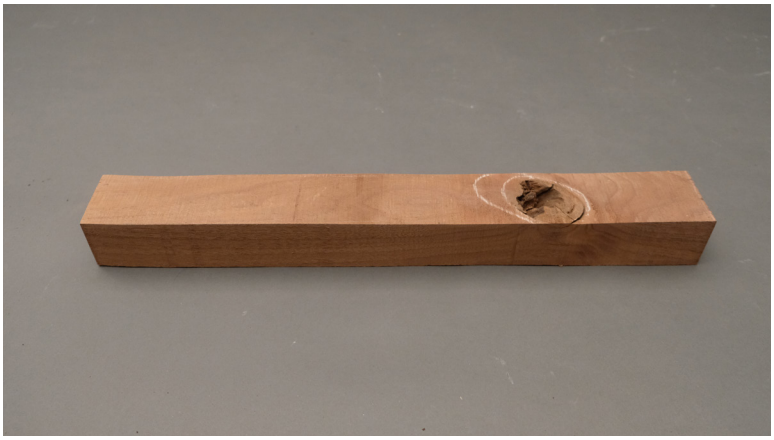


fig. 3.47 **Knot**

fig. 3.48 **Knot**

fig. 3.49 **Knot**

fig. 3.50 **Knot**

fig. 3.51 Unfinished Chair

not sure if this was the best decision for longevity. The movement of large slabs of wood are usually at least guided by another part of the chair, such as the backrest or stretchers in the legs. If needed, I can remedy any extreme warping in the future by attaching stretchers in the legs. For now, only time will tell how well the seats will hold their form through seasonal changes.

fig. 3.52 Unfinished Seat

fig. 3.53 Unfinished Seat

fig. 3.54 **A Chair**

fig. 3.55 Table Base and Chair

DINING TABLE

The individual tableware, shared serving dishes, and chairs in the table setting are set on a 54" diameter table, which provides enough space for six diners and a generous setting for four. It is the same size as the table that has been used by the kids at family gatherings, to host birthday parties and serve homecooked meals in my parents' home. Diners share the single table surface as the common ground on which each person negotiates their individual space with the shared space with others.

In Chinese banquet halls, the table can be expanded by adding a larger round top. The round shape allows as many guests to be added to or taken away from the table while still maintaining the spatial unity of the group. All guests at the table are seated at an equal distance to the food, and each of them can equally participate in the conversation.

At the scale of the body, the table forms a public realm in which action between diners occurs. As Arendt describes, the only way we can know a person is through the tangible forms of their actions and speech[11]. Gathered at the table, each diner converses with one another, passes food to each other, and expresses their gratitude. Their interests and desires are revealed by how they address one another and use the material objects before them[12].

11. Arendt, *The Human Condition,* 179.
12. Ibid, 182.

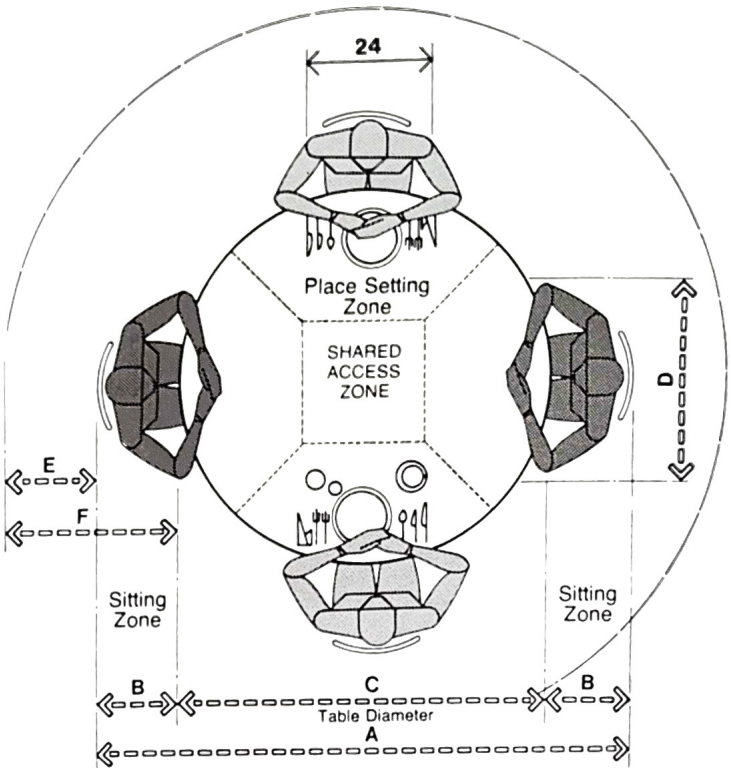


fig. 3.56 Circular Dining Table for Four

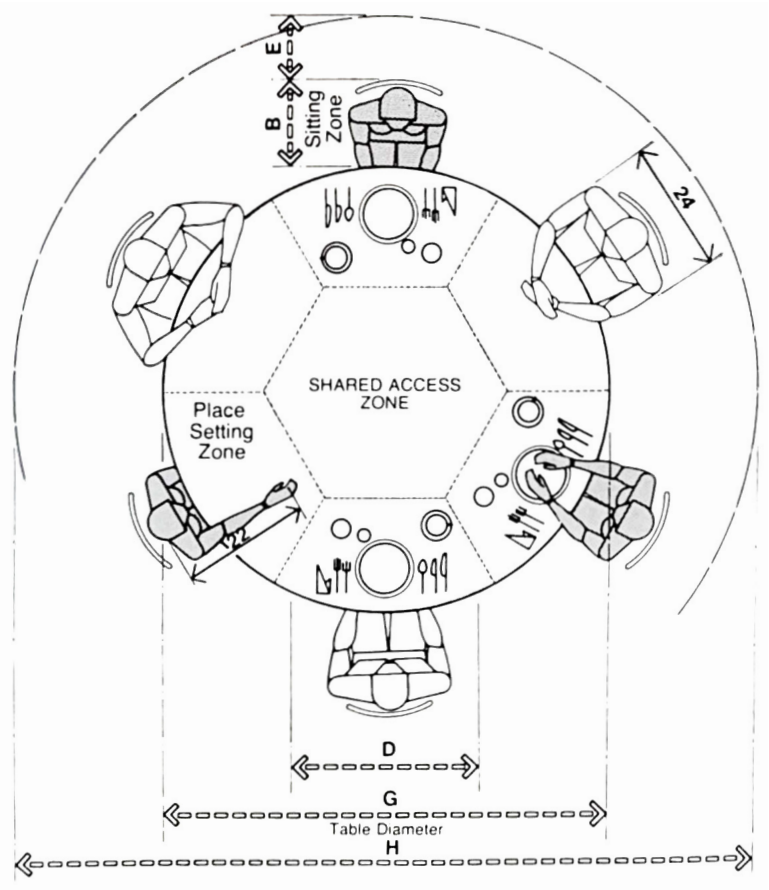


fig. 3.57 Circular Dining Table for Six

fig. 3.58 Chiseling Lap Joints

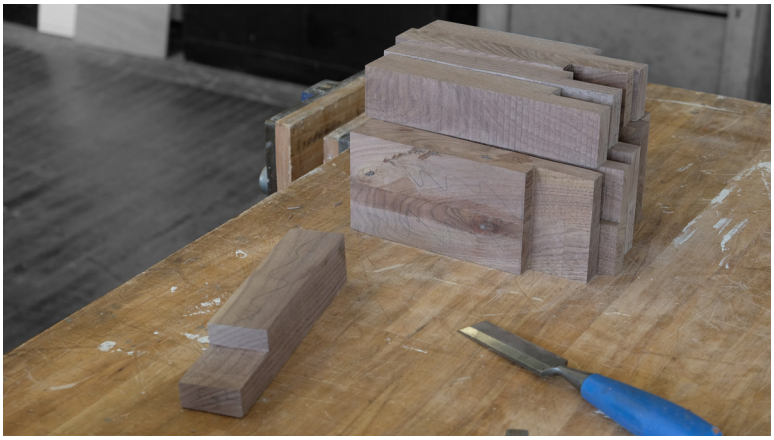


fig. 3.59 Lap Joints

fig. 3.60 Chiseling Bridle Joint

The Base

The base of the table consists of an apron to hold the tabletop flat, a pillar of legs in the center of the table, and feet that spread out to form the foundation. Each component is arranged in a radial array to keep the edge of the table free. It allows more diners to join or leave the table while maintaining a unified whole.

By the time I finished cutting the rough pieces for the chairs and the tabletop, I didn't have much wood left to make the base. Not a lot of the leftover wood was long enough for any of the components, but there was at least enough wood to splice together.

To make the most of the little material that I had, I designed the base to be made of thin components. With simple lap joints, I spliced smaller pieces of wood in longer members, which only required two cuts. I glued pieces from the same cross-section of the tree to maintain as much of the same grain pattern as possible in each assembly.

I often agonized over each irreversible decision in the process of fabrication. Since I was designing as I made the table, I was never entirely confident about each cut, even after planning and measuring out each piece. After I had glued up the lap joints, I struggled over whether using bridle joints would have been a better alternative. The pedestrian lap joints divide the wood with an unsightly seam down the middle, while the bridle joints would have divided it into a more balanced composition of three parts. In hindsight, nobody would have noticed.

The table legs are connected to the apron and foot with t-bridle joints. The legs are cut from the same part of the slab and oriented to preserve the original tree pattern. Each subsequent slice is placed in rotating order to unfold the pattern of the slab in the central pillar of the table base. The legs slot into the apron and feet members to create strong moment connections.

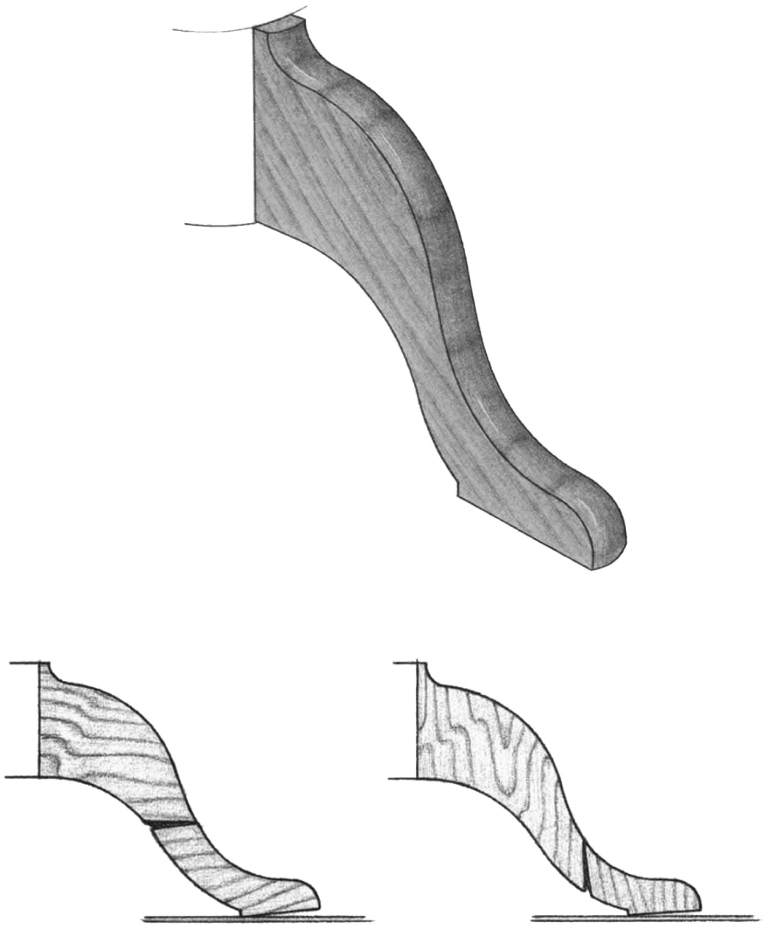


fig. 3.61 Strong and Weak Grain Direction

Each member of the apron and foot are connected in the center by a three-way lap joint. I chose to work with fairly slender pieces, partly because of a scarcity of material, and also because I wanted to see how little I could get away with. Ideally, the forces acting on the table are distributed throughout the six-sided base. The thickness of each member resists twisting, while the depth resists vertical bending forces from objects placed on top of the table. Since most of the weight will be acting in the vertical direction, it was more critical to have a thicker depth than a thicker width.

The grain on the diagonal members of the feet are oriented along the length of the feet to provide as much strength as possible. The cellulose fibers that run along the grain of the wood are stronger than the lignin bonds that connect the fibers together, so the long grain is more effective in bearing weight[13]. To attach the diagonal members of the feet to the horizontal members, I angled the lap joints on the diagonal members.

What I neglected to account for was that the three-way lap joint would notch into the center of each member, reducing its effective structural length in half. While the apron could get away with the compromise since it would be attached to the tabletop, the foot needed to be strong enough to bear the entire weight of the table.

I realized this when I accidentally broke a member of the foot when I leaned on the middle to see how far it would bend. It turned out, that it couldn't bend very far before it split. It was designed to only have 1/4" spanning the entire length of the member, which wasn't ideal, but perhaps strong enough. But when I was cutting the notches for the leg bridle joints, I accidently cut too deep, severing the continuous length. While I had patched over the notch in with a small piece of wood, the force couldn't transfer across and the lignin

13. Strother Purdy, "A Guide to the Wayward Ways of Wood Grain," Fine Woodworking, May/June 1998, accessed July 23, 2019, https://www.finewoodworking.com/membership/pdf/7487/011130088.pdf.

fig. 3.62 Chiseling the Three-Way Lap Joint with a Jig

bonds in the grain split where the notch had been. I have since glued the piece back together, but the member is still susceptible to split again in the same area.

While each individual member of the foot is base, the assembly of the entire base is stronger. Each member should act as part of a truss, distributing the forces throughout. Even though the base is able to stand on its own, I am apprehensive about putting the full weight of my body on the table. Sometime in the future, I will probably have to reinforce the foot of the base to make it thicker or add tension-ties to the three-way lap joints. For now, it is strong enough to bear its own weight and the weight of the tableware.

I sanded the pieces of the base with a palm sander after the joints were cut. Immediately, the surface of each piece was noticeably less orthogonal, despite using finer grits of sandpaper to sand with. While the pieces still looked generally straight, the lines felt softer in my hands. The finish was smoother and the slight deviation from being truly straight made the pieces more pleasant to touch.

fig. 3.63 Table Apron Bridle Joints

fig. 3.64 Table Base Bridle Joints

fig. 3.65 Chair and Table Base

fig. 3.66 Black Walnut Edge Grain

The Tabletop

I have a tendency to overdesign everything. As with many workaholics, my insecurities show through in my work. My table base has eighteen lap joints, twelve bridle joints, twelve dowels, too many butt joints, and it will need some kind of connection to the tabletop, which will add at least another twelve joints.

As a beginner woodworker, I worry that my things will fall apart. I spend too much time staring at my work pieces trying to figure out if they will be strong enough. I worry that my work looks awkward, so I make countless models and iterations to look for the more beautiful proportions. My concerns are never satiated. I'm either guilty of being inefficient, guilty of producing poor work, or I'm both at the same time. Each flaw reignites a hunger for some kind of beauty or perfection that I can't humanly attain. So now, I have a table setting, with all the dishes, chairs, and table base, but not a tabletop.

Despite its simplicity, the tabletop makes me nervous. At this point, I can only desecrate the last remains of the tree further. In haste, I cut the slabs in half months before I was ready to work on the tabletop. When I learned how to plane them as whole pieces, I glued the halves back together to restore them to some resemblance of their original form. Even if I perfectly matched the grain, the scars of my cuts will still show in the hairline seams.

I can picture what I need to do to finish: flatten one face of the slabs on a sheet of MDF through the thickness planer, plane the other side, joint and cut the edges, glue the pieces, then cut the shape of the circle on the CNC machine. I'm not entirely sure I'll be able to squeeze a full 54" diameter table out of the wood, but I can settle for 48" if I can't. After that, I'll need a butterfly key or two to reinforce some of the cracks in the lumber. For the most part, these are familiar processes that I could finish in two or three weeks at most. Somehow, of all the pieces, I've managed to leave the table in the table setting to the last minute.

fig. 3.67 Tabletop Slabs

My endeavour to create a table setting has no definite end. The collection of tableware can grow as I continue to throw pots, and more furniture can be added as I work with wood. In addition to the table top, the table setting could also use a set of spoons, a lamp, a teapot, and cups. I could make a turntable for rotating the shared dishware around the table like in *dim sum* restaurants.

At the very least, the pieces in the set could be replaced by better crafted items. The more experienced potters in my pottery studio often replace the older sets of mugs in their kitchen cupboards with their newest creations.

Each of the objects I have so far were made by a beginner potter or woodworker. By technical standards, there is room for improvement. The finish on the stoneware pieces is too rough, the wooden bowls have thick bottoms, the chopsticks are uneven, and the furniture joints are too loose. By aesthetic standards, the pieces are awkwardly shaped and could be more refined. My hope is that the set will mature over time as things inevitably get lost, break, or are given away, and new items are made, received, or bought.

According to Arendt, the creative act requires the presence of an audience. Unlike fabrication, where the finished product is the objective end goal, the product of a creative act is part of a web of relationships between people. It cannot be made and used in isolation, it requires a response in action or speech[14].

A diner needs to use a pair of chopsticks to fulfill its purpose. It takes part in the public realm when it becomes a tool for a host to serve others. While customs generally guide how the chopsticks are expected to be used, they don't need to be used in a prescribed way to respond to the creative act. When I serve food in my table setting, any way a diner receives the meal completes the creative act.

As architects, designers, and artists, we have the capacity to make something in the world that transcends ourselves. Material

14. Arendt, *The Human Condition,* 188.

fig. 3.68 **Live Edges**

things give intangible human action a permanence, long after the act is finished. The action itself lingers in the form of the product used. After the product is decayed, it continues to live in the form of speech and stories.

For now, I'll leave my slabs as they are in their raw state. I won't be able to invite anyone for dinner yet, but I hope I will be able to soon.

fig. 3.69 Bookmatched Slabs

THE DINING ROOM

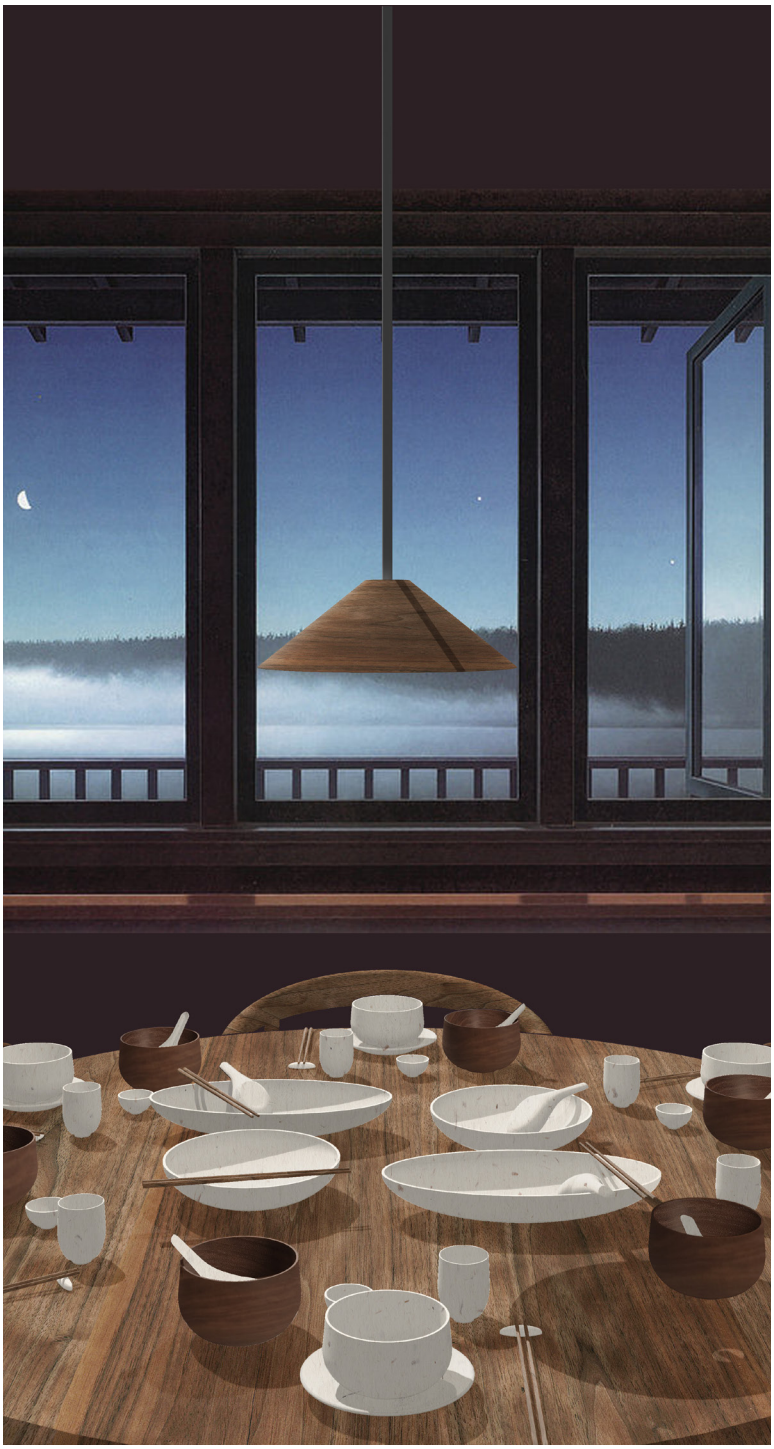


fig. 4.1 The Table Setting in Christopher Pratt's "Half Moon and Bright Stars"

fig. 4.2 Lumber Storage

Once the table has its top, I'll be able to enjoy the fruits of my labour. I'll invite people over for dinner parties to share good food and conversation, or eat a regular dinner with Nathan. Between the two of us, he is the better chef. He has a natural aptitude for playing with recipes and can improvise a few simple ingredients into a dish with a great depth of flavour. We usually grab groceries to cook in whoever's house has a better kitchen.

Depending on the recipe, one of us cooks the main dish, usually Nathan, while the other prepares the sides and cleans the pots, usually me. We try to prepare enough food for a few days. If we cook again before the food has run out, we'll make another dish to compliment the leftovers. It stretches out the leftovers while adding variety.

We typically serve the food on tableware our landlords stocked from Value Village and the odd dish previous tenants left behind. For a while, we also used pottery that I made until a few broken bowls proved they were too fragile for shared student housing.

We say grace before we eat together. It falls into some variation of thanking God for providing the food and the company of each other, then asking Him to bless the food as nutrition for our bodies and our time together in conversation over dinner. It's a routine, formulaic prayer that comes out with little thought.

After a long day of physical work and spending the last of my energy cooking, I'm too tired to consider whatever plant or creature gave up its life so I could have mine. I rush through the prayer and scarf down my food, so I can refuel for the evening. I eat to survive so I don't over-exhaust myself from work.

While I'm not always as grateful as I should be before dinner, the repetition of saying grace keeps the sanctity of things in the back of my mind. It primes me for an opportunity to be reminded of what I've been gifted with, because I am most grateful when I am humbled by the stresses of the day.

When I've struggled through a long day in the workshop, it consumes my mind as I try to figure out how to move forward. In

fig. 4.3 Unfinished Chairs

those moments of weakness, I recognize my dependence in a world beyond my control. Burdened with this struggle, each routine task in making dinner feels like a drudgery when I could order a cheap pizza and pop down the street. Without the luxury of time, cooking is merely a toil to survive.

So, it is a gift to have someone to help lighten the load. As Arendt describes:

> No human life, not even the life of a hermit in nature's wilderness, is possible without a world which directly or indirectly testifies to the presence of other human beings[1].

When we open ourselves to see the work that goes into making things, we see the love and care that makes them meaningful. While the act of eating metabolizes food into intangible energy, the creative act of making turns the intangible moments of everyday life into a material manifestation. I hope that in the same way these objects mark my experiences as a beginner potter and woodworker, they will one day embody the memories of my daily routines and rituals.

1. Arendt, *The Human Condition*, 22.

BIBLIOGRAPHY

Anderson Jr., E.N. and Marja L. Anderson. "Modern China: South." In *Food in Chinese Culture*, edited by K. C. Chang. New Haven: Yale University Press, 1977.

Arendt, Hannah. *The Human Condition.* Chicago: University of Chicago Press, 1958.

Benjamin, Walter. "The Work of Art in the Age of its Technological Reproducibility." In *The Work of Art in the Age of its Technological Reproducibility and Other Writings on Media,* edited by Michael W. Jennings et al. Cambridge: Belknap Press, 2008.

The Bridle Walk: The Pearl. Markham, Ontario: Monarch, 2001.

De Waal, Edmund. *The White Road.* New York: Farrar, Straus and Giroux, 2015.

Ecke, Gustav. *Chinese Domestic Furniture: In Photographs and Measured Drawings.* New York: Dover Publications, 1986.

Hopper, Robin. *The Ceramic Spectrum.* Radnor: Chilton Book Company, 1984.

———. “Using Wood Ash in Glazes.” Ceramic Arts Network. Last modified June 18, 2018. https://ceramicartsnetwork.org/pottery-making-illustrated/ceramic-supplies/ceramic-glazes-and-underglazes/using-wood-ash-glazes/#.

Illich, Ivan and Barry Sanders. *The Alphabetization of the Popular Mind.* San Francisco: North Point Press, 1988.

Ingold, Tim. *Making: Anthropology, Archaeology, Art and Architecture.* London: Routledge, 2013.

Katz, Matt. “Boron in Glazes.” Ceramics Monthly. Last modified September 2012. https://ceramicartsnetwork.org/wp-content/uploads/2008/10/TF_BoroninGlazes_0912.pdf.

Laguna Clay. “Chemical Composition of Gerstley Borate.” Last modified July 5, 2011. http://www.lagunaclay.com/support/pdf/Chemical_Composition_of_Gerstley_Borate.pdf.

Leach, Bernard. *A Potter’s Book.* Great Britain: Transatlantic Arts, 1973.

Leininger, Madeleine . “Some Cross-Cultural Universal and Non-Universal Functions, Beliefs, and Practices of Food.” In *Dimensions of Nutrition,* edited by Jacqueline Dupont. Boulder: Colorado Associated University Press, 1970.

Lorrain, Claude. “Ascanius Shooting the Stag of Sylvia.” Digital image. Wikipedia. October 20, 2016. en.wikipedia.org/wiki/File:Ascanius_Shooting_the_Stag_of_Sylvia_1682_Claude_Lorrain.jpg.

Mastelli, Rick. "Sam Maloof: How a Home Craftsman Became One of the Best There Is." *Fine Woodworking*, 1980.

Mullins, E. J. and T. S. McKnight, eds. *Canadian Woods: Their Properties and Uses*, 3rd ed. Toronto: University of Toronto Press, 1981.

Nakashima, Mira. *Nature Form & Spirit: The Life and Legacy of George Nakashima*. New York: Harry N. Abrams, 2003.

Nelson, Harold B. *The House That Sam Built: Sam Maloof and Art in the Pomona Valley, 1945 – 1985*. San Marino: The Huntington Library, Art Collections, and Botanical Gardens, 2011.

Otto, Rudolf. *The Idea of the Holy.* London: Oxford University Press, 1950.

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

Panshin, A.J., Carl De Zeeuw, and Harry Philip Brown. *Textbook of Wood Technology*. New York: McGraw-Hill Book Company, 1964.

Ponder Jr., Felix. "Characteristics of Good Growing Sites for Black Walnut." USDA Forest Service. Last modified 1998. https://www.ncrs.fs.fed.us/pubs/misc/walnut/p38_43.pdf.

Pratt, Christopher. "Half Moon and Bright Stars: My Bedroom in September." Digital image. Christopher Pratt - Drawing From Memory. https://www.exhibits.therooms.ca/ic_sites/pratt/art/showcase/half_moon_bright_stars.htm.

Pye, David. *The Nature and Art of Workmanship.* London: The Herbert Press, 1995.

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

Serra, Richard. "Horizontal Rectangle to the Floor." Digital image. Horizontal Rectangle to the Floor. 2019. https://www.christies.com/lotfinder/Lot/richard-serra-b-1939-horizontal-rectangle-5536511-details.aspx.

Sutherland, Brian. *Glazes from Natural Sources.* London: A&C Black Publishers, 2005.

Swank, in Scott T. Swank. *Shaker Life, Art, and Architecture: Hands to Work, Hearts to God.* New York: Abbeville Press, 1990.

Tucker's Pottery Supplies. "Safety Data Sheet." Mid Smooth Stone, Last modified February 14, 2018. https://tuckerspotteryeshop.com/wp-content/uploads/msds/clay/Mid Smooth Stone - English SDS (2018).pdf.

Wirzba, Norman. *Food & Faith: A Theology of Eating.* New York: Cambridge University Press, 2011.

APPENDIX

fig. 5.1 Keyed Lumber Growth Diagram

fig. 5.2 Small Slab End Grain

fig. 5.3 Large Slab End Grain

fig. 5.4 Chair Seat Rough Cut Diagram

fig. 5.5 Chair Legs Rough Cut Diagram

fig. 5.6 Chair Back Rough Cut Diagram

fig. 5.7 Table Base Rough Cut Diagram

fig. 5.8 Table Top Rough Cut Diagram