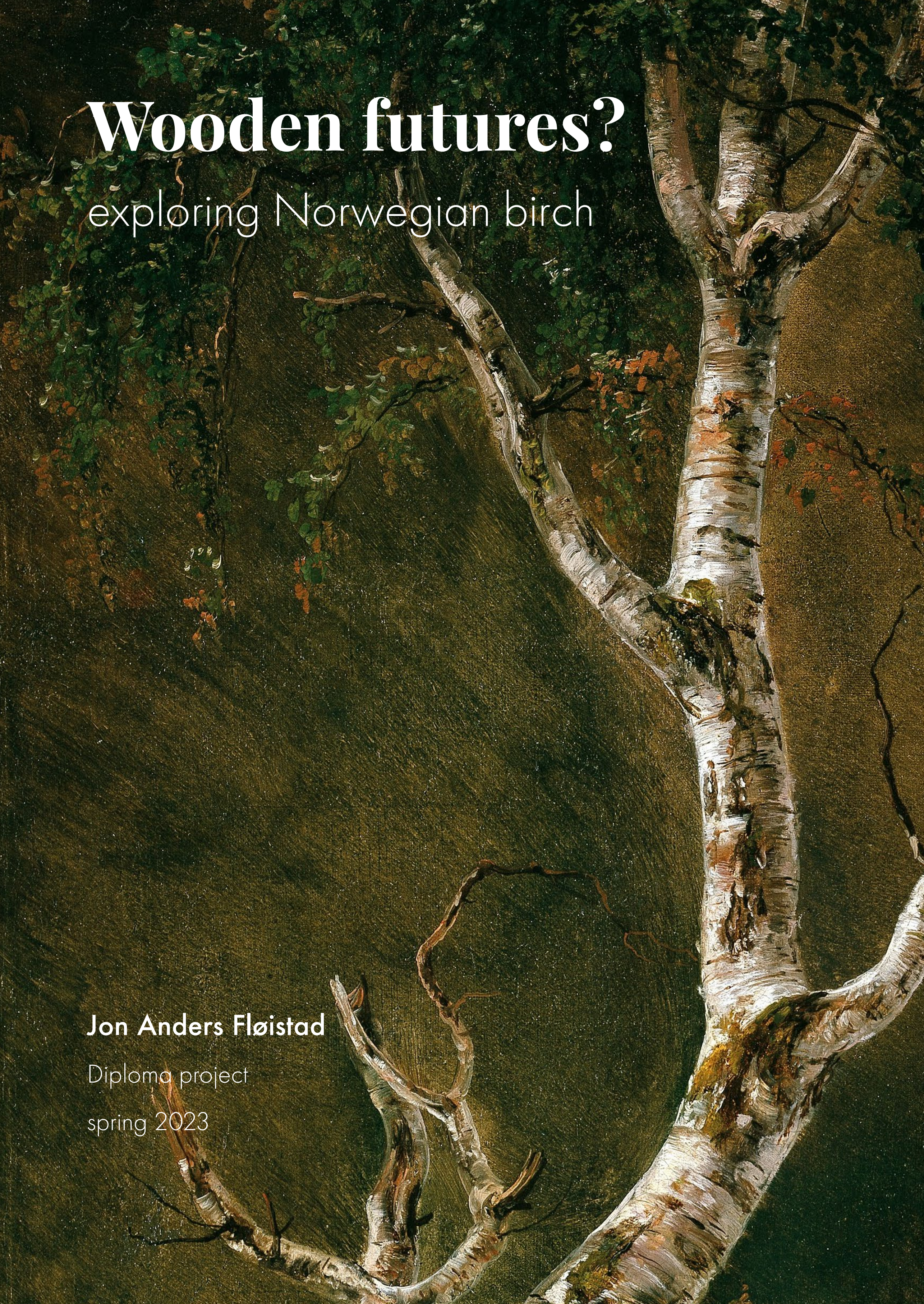

Wooden futures?

exploring Norwegian birch

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Diploma project

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Discipline Industrial design

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Abstract

Every year, Norwegian forests grow more timber than what is harvested, and birch is the most under-utilized species of wood in our forests. Utilizing more of this green material requires both infrastructure, regulations and (customer) demand, and design can help create products from this material.

The material-driven design process reverses the typical approach to product design by starting with a material and designing product applications from that. Inspired by the material-driven design process, I have attempted an approach based on exploring and experiencing birch wood through seven plus one product concepts.

Throughout the project, I have also attempted to work with how to justify designing more products in a world that seems «full». We are in the midst of a global crisis of both climate and nature, fueled by the way we consume. We need new materials, and new ways of using the materials we already have, to make the required changes for the future ahead. In a world that seems determined to make everything disposable, we need to design objects that have value to the consumer, are made to last, and through that, are sustainable. In my master thesis I have explored ways to do this, and I believe responsibly harvested, locally sourced wood can be a part of the solution. Norwegian birch is a local example of wood that has especially good potential.

Table of Content

Introduction

7 weeks, 7 concepts

Conclusion

Why? (I do this)

This project started for me with a struggle to justify designing new physical products in a world seemingly filled to the brim with stuff. I found a quote from a keynote by Tom Morgan helpful in managing this conundrum of ***moral geometry***[1]:

«If we want to live in a world with less material goods & greater wealth we have to focus on designing value that doesn't objectively exist.»[2]

He argues for using branding and storytelling to infuse products with more meaning, and that more meaningful products are more sustainable. A more meaningful product will occupy more of our attention, which leads us to spend more time with that product instead of purchasing more.

Meaningfulness makes the product less disposable.

Tom Morgan argues that designing products with greater emotional value and lesser material requirements can be a way forward to a more sustainable future. In light of this I have wanted to explore products made with less material and ecological footprints, and more emotional impact over time. Wood is a material I believe to offer both a smaller environmental footprint and a greater potential for emotional connection – if used correctly. Patina can be a way of forming such a connection to a product over time, and can be facilitated by choosing a sufficiently «soft» material[3] – like birch wood.

Birch wood is a material we could have an abundant supply of in Norway. Each year there grow about as much birch wood in Norwegian forest as there grow pine

1 Moral geometry is a term I borrow from art historian Kakuzo Okakura, who uses it in writing on the ritual of tea ceremonies. He argues this way of creating a complex ritual around something so simple as tea-drinking «is moral geometry, inasmuch as it defines our sense of proportion to the universe» Quote borrowed from Adamson, G. (2018) p. 115

2 Tom Morgan, from NONSPACE, keynote at IDC 20.10.2022

3 Adamson, G. (2018) p. 144

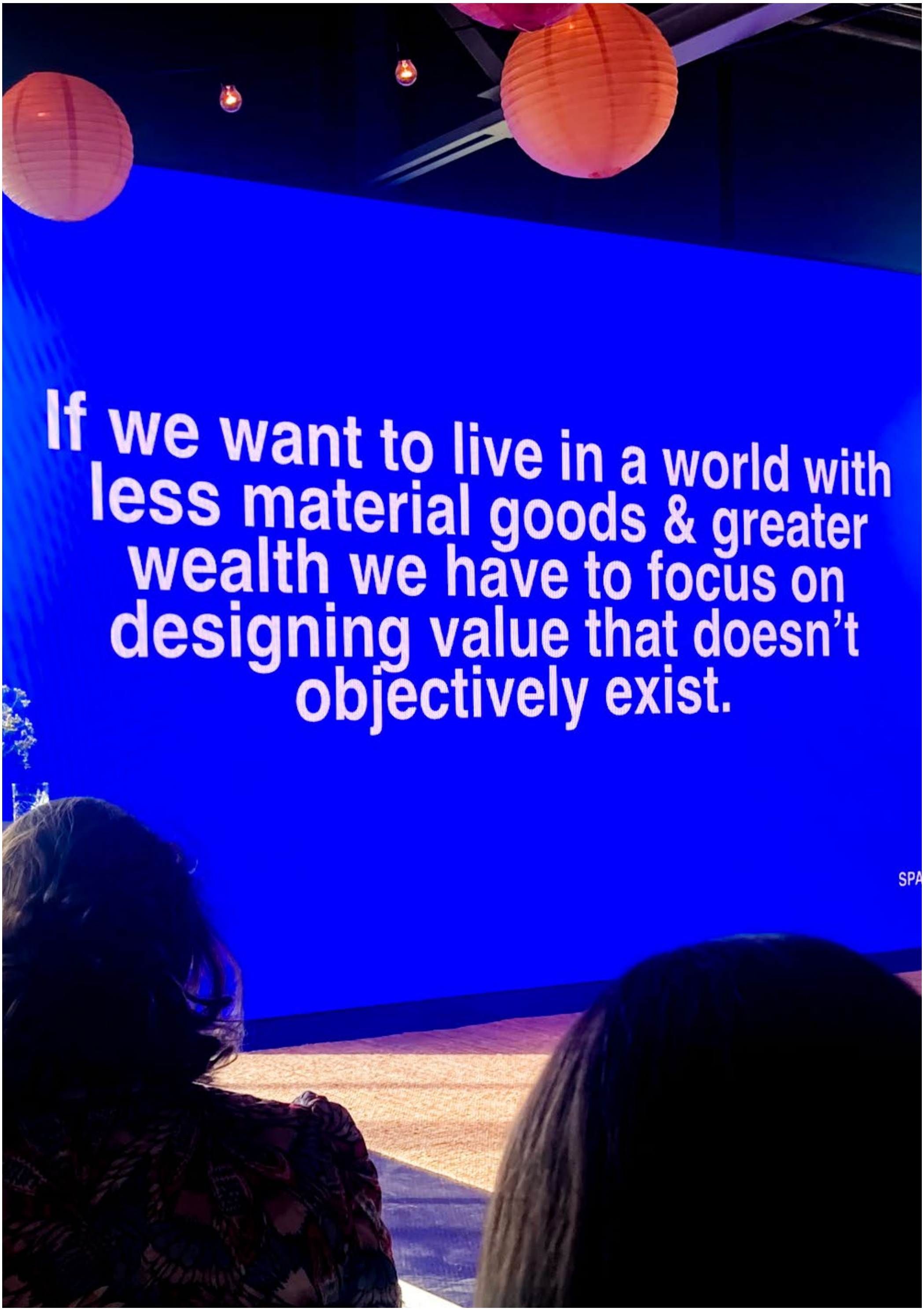
or spruce, species of wood that is typically harvested in large quantities. The amount of birch that is felled each year is however only about one tenth of what is felled of pine or spruce. For those three species the new growth each year is greater than what is felled, but birch seems to be a significantly untapped resource, as identified in the report ***"Bjørk i Norge"***[4].

Another, more personal, reason for this project is how products with bad imitations of wood in stores has started to get on my nerves. Steel hydro-dipped to imitate wood grain, plastic painted with wood texture, MDF or chipboard covered in printed foil imitating wood - and all of them often seen together. To be frank it gives me slight nausea thinking of how fast those surfaces will degrade to something that is just begging to be disposed of – thus generating more trash. Seeing the side table pictured below triggered the writing of this diploma project.

At the same time, the UN works on a «historic»[5] treaty to end plastic waste[6], and the EU identifies packaging as a main contributor to waste as ***"40% of plastics and 50% of paper used in the EU is destined for packaging"*** and ***"each European generates almost 180 kg of packaging waste per year."***[7] This is also, in ways, a problem of disposability, and aligns with how bad wood imitations has a tendency of becoming waste.

A final reason for doing this is climate awareness.
The facts of global warming should not be news to anyone at this time, but how we combat it is still not settled. Reducing emissions is important, but no longer enough. Negative emissions – removing carbon from the atmosphere – is increasingly talked about as necessary, but technological solutions like carbon capture and storage is yet to deliver on decade-old promises. Trees, on the other hand, are capturing carbon for free, every day.

4 Zimmer et al (2023)
5 Hahn, J. (2022)
6 UNEP (2022)
7 European Commission (2022)


If we want to live in a world with less material goods & greater wealth we have to focus on designing value that doesn't objectively exist.


SPACE®

My Goal

for this project has been threefold:

Exploring birch as a material in context of norwegian forestry[1]

Exploring the process of material exploration through product design

Making product concepts that inspire further usage of the material.[2]

1 Through product concepts developed for the perticularities of birch from Norwegian forests, as described in Zimmer et al (2023) and found during this proect.

2 And through that hopefully challenging the expression “wooden” Merriam-Webster.com Dictionary (2022)

Investigating

(future uses for)

birch wood

through

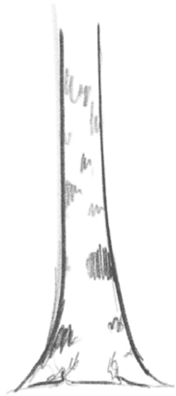
explorative products

with

disposability

as a

filter



Starting point:

Manifesto?[1]

I[2] prefer solid wood over laminated wood[3]
laminated wood over plywood[4]
plywood over particle board[5]
particle board over veneered anything[6]
anything over synthetic imitations[7]

and any rules to be challenged.

1 This is a manifesto from the starting point of this diploma. As manifestos are relatively foreign in this format, it can also be regarded as a hypothesis through statement, and as such, it is made expressly for being challenged through the process onwards. They are also statements of some of the values and perceptions I started this work with, and a warning about how I might be a biased author. It is kept unchanged as a relic of where I started.

2 I, having a background as trained woodcarver before starting my studies in industrial design. Not to say it's (just) the cractsperson in me stating this, but it might have an influence.

3 There are good reasons to laminate - both to save materials, increase strenght ect.. But here I'm talking about preferences. And lamination necessitates glue, increasing both price and ecological footprint

4 Plywood requires more glue per mass unit of wood, and necessitates a much more restrictive sorting of the raw timber[i]

5 Particle board (and MDF) requires even greater amounts of glue,[ii] and further alienates from the material as found. It also removes further more of the inherit challenges in the material, taking away some of its formal identity.

6 There is an element of occlution and tricery in veneering. I don't propose that veneering is inherently bad, but that my preference is to avoid it, sparing it for only the occations where it is genuinely neccesary. There should also be a solid core for the veneer to be applied to, and a thought to if the choice of veneering influences the life expectancy of the product.

7 See picture of emotional starting point of this project.[iii] This statement (may) involve an element of snobbery and elitesism, and there are good reasons to immitate materials, and plenty of good historic examples of valueable imitations. But I find that the bad examples outnumber the good to such a degree that I want to avoid immitations as far as possible. Or until there is a really fun reason not to.

i Zimmer et. al. (2023)

ii Blass, H.J. (1995)

iii Picture of fake-wood-table on page 10

Method

The method of exploring birch as a material for industrial design has been part of the intended outcome of this diploma. I started this with a goal of testing wether the design exploration method of the diploma «A good chair»[1] was applicable to material exploration. This method is (partially) based on projects like "Exercises in seating" by designer and Artist Max Lamb (2015), and "Daily Spoon" by Stian Korntvedt Ruud (2015). For me another relevant project and book has been «52 Boxes in 52 Weeks» by Matt Kenney. They all reflect on the qualitative value of quantity – and the learning outcome of doing a design task over and over again with small variations. This approach is parallel but not equal to the «Material Driven Design (MDD)»-framework.[2] Where the MDD-approach consists of four phases of understanding the material, characterizing it, manifesting the experiences of it and then designing concepts, my proposed approach absorbs some of the same processes in a condensed form, but has the main focus on repeatedly creating product concept based on the material at hand.

As the framing of this project is about a material and not one specific product (chair, spoon, box ect.), I've settled on «disposability» as a filter for picking multiple products to explore the material through. This is both about designing for better single-use and disposable product, but also addressing products that aren't typically single use, but often still made to be disposable.

The overall structure of this diploma has been based on a triple-diamond model.[3] The first diamond consists of a planning- and research phase stretching into what I have called week zero (W. 0), where the foundation for the project has been set. This includes a set of value-words and material properties to use for picking the actual products to be made in the next phase. [4]

Diamond two has consisted of seven «double-diamond weeks», with one product concept for each week, each concept building on one or

1 Jøraandstad, M., (2020)
2 Karana, E. et.al. (2015)
3 From the double-diamond model popularized by the British Design Council (2005)
4 Experience from the execution of this diploma project has made it clear to me that I also should have (pre-)defined the exact products for the next phase here.

more small piece of research. Each week has been built partly on the previous weeks, forming cascading double-diamonds, each building a bit further. At the end I set of a few weeks to catch up on loose ends from each of the seven weeks, and this proved a valuable opportunity to reflect on what I had learnt throughout the process .

The work on form and visual expression for the concepts has in the same way been a continuum throughout the project, with each artifact borrowing some from the previous. At the same time a degree of influence from forms in nature, especially in birch trees themself, has been a subtle yet consistent factor.

The experiments and concept design done throughout this project have not been intended to be comprehensive, but each probing in different directions of potential. The intended outcome has not been rigorous scientific experiments nor finished products, but tinkering and experimentation to fuel concepts that display (some) opportunities of the material.

"[...]to know a material with your hands and not just your head"[5]

5 Midownik, M. (2013) p. 10. This quote says much about what I have wanted to get out of this diploma, and highlights (together with i the book "The Man who Made Things Out of Trees" by Robert Penn (2015), that has also been an inspiration) the value of learning a material through hands-on work with physical artifacts.

Density floating heavyness lightness balancing

Flexibility bending moving formed adapting

Plasticity forming deforming adapting

Patina furniture holding travelling memories heritage

Repairability patina lasting sustainability crafting adapting

Sustainability CO2 labour price weight size nature

Grain workabilty splitting ornament

Tactility touching carrying sitting holding

Low tech interacting

x

Acoustics listening knocking

History remembering recording lasting

Hygroscopic absorbing breating

Ornamental patterns craft

Strenght trusting thickness weight

Imitation pretending untruth communicating

(Hyper)local non-traveled small-scale

Composite mixed strong noncircular

Monomaterial honest simple

Multimaterial complex multifasceted

Translucency light airiness glass

Cosmetic
Containing
Eating
Stirring
Sitting
Sleeping
Protecting
Combing
Insulating
Holding
Displaying
Supporting
Repairing
Heating
Cooling
Transferring
Making
Growing
Handling

c containers - product remaints/leftovers - "thermal recycling"
Snusbokser
Samples
Beach Cleanup stuff * (lists)
McDonalds/fast food-leker
Phone covers
Vegetable containers
paint brush handles
Sanitærprodukter
Christmas ornaments
Diapers
Survey folks about wishes for non-plastic
Buisness-/ event-cards
Planters
Footwear
Buttons
(Cheap) Glasses/Eyewear
(single use) razors
Fake flowers (There are some in silk, but expensive)

Tampongapplikatorer

x

[7 x product]

Festival wristband
Food pacaging
Straws
Youghurt spoons
Toys
Single use curtlery
Dokumentmapper /-vesker
Kitchen utencils
Tape
Furniture
Pens & markers
Arcitectural pieces
Sex toys
Drinking bottles
Hair brushes

Combs
Insert __________?
Cleaning products (Microfiber cloth alternatives)

List of qualities & potential product categories

Data?

Beach cleaning is a messy data source. For choosing the 7+1 products for this project I've tried out multiple data sources to base the decision on. One I believed in early on was using data from beach cleaning. I tried both data from large organizations published online, and doing my own little cleaning effort, but in each case the main finding is that most of what is found at the beaches is broken down beyond recognition.

I found:

Building materials,
shotgun wads,
glass shards,
rope & strings,
but mainly
unidentifiable large
and small bits of plastic.

For this reason I did a mapping of product size and volume consumed of different categories of products, and played a bit around with changing out the axis. Product complexity versus imagined impact was a meaningful one for me. This proved a more reliable method of picking topics for weeks 1 through 7.


Infrastructure
Furniture
Seating
Instruments
Storage
Utencils
Tools
Decor
Lighting
Collectibles
Jewellery
Product size
Production volume

Transport

Arcitecture

Mobility

Fuel

Sports

Clothes

Packaging

Electronics

Toys

Stationaries

Single use

Some wooden terms

Wood in products is rarely just wood. Usually the surface has undergone treatment, different pieces are joined together with some bonding material (glue, screws ect.), the wood might be layered on top of another material (as a veneer on top of a substrate material), and wood can also be used as one part (constituent material) of a composite material. Occasionally a stabilizing compound is added to otherwise solid wood in order to enhance or modify the properties of the wood. Some terms[1] that is useful for reading this report:

Chipboard - board / sheets of wood chips glued together. Cheap, relatively hard, moderately strong. Aprox. 15% glue and other addetives.

Veneer - thin slices of wood peeled, sliced or sawn from the log. Usually only the best trees can be used for veneer production.

1 Blass, H.J. (1995)

Plywood - Sheets of veneer bonded together in layers with alternating grain direction. Properties similar to solid wood, but where solid wood is much stronger along the grain than across, plywood is "averaged" in both directions.

MDF - Material made from wood fibers bonded together with glue/resin. More expensive than chipboard. somewhat weaker than solid wood, easily damaged. Around 10 % glue and other addetives.

Hardboard - Material made from wood fibers like MDF, but the wood fibers are bonded to themselves using only heat and water. No added glue, but higher water- and energy usage than MDF. Textured on one side.

W. 0 Basics

ornament

As a starting point I wanted to investigate the appearance and basic properties of the material in its raw form - trying to determine if it can be captured in a standardized material sample. Looking for the basic properties it appeared reasonable to look to basic geometric forms, as they would also function as potential building blocks for the product experiments to come. As this week is set to be a starting week, I wanted to start small, yet do something relevant. This was also not intended to be part of the main concept work of this project, hence number zero.

For the physical samples I have created cubes with sides of 50 millimeter. This format fits well in the palm of a hand, inviting exploring the material with your hands.[1] The cubes are cut with one side presenting nearly a perfectly radial cut in the log. Cutting it like this one side should also be perfectly tangential to the grain, two sides ends up being end-grain, and the two last gets a mix of radial and tangential grain. The idea is this should expose the widest possible sampling of surfaces.

Along the same line of reasoning I have made spheres and cylinders of similar volume, to explore if they present other faces of the wood. The production of these shapes quickly proved the value of the cubes being much quicker and simpler to (re-)produce, but all forms show somewhat different «grain pictures», and the conclusion of this small exercise was for me more that no «ideal» form displaying all qualities of a type of wood is

1 This also leaves the total volume at 1/8 liter, making calculations of density simple for comparing with other materials, and fits well with two inches (51 mm) being among the most commonly sawn thicknesses of wooden planks - hence an easily reproduced size.

possible, and that there is a value in exploring multiple forms not just for the form itself, but for the patterns they reveal in the underlying wood.

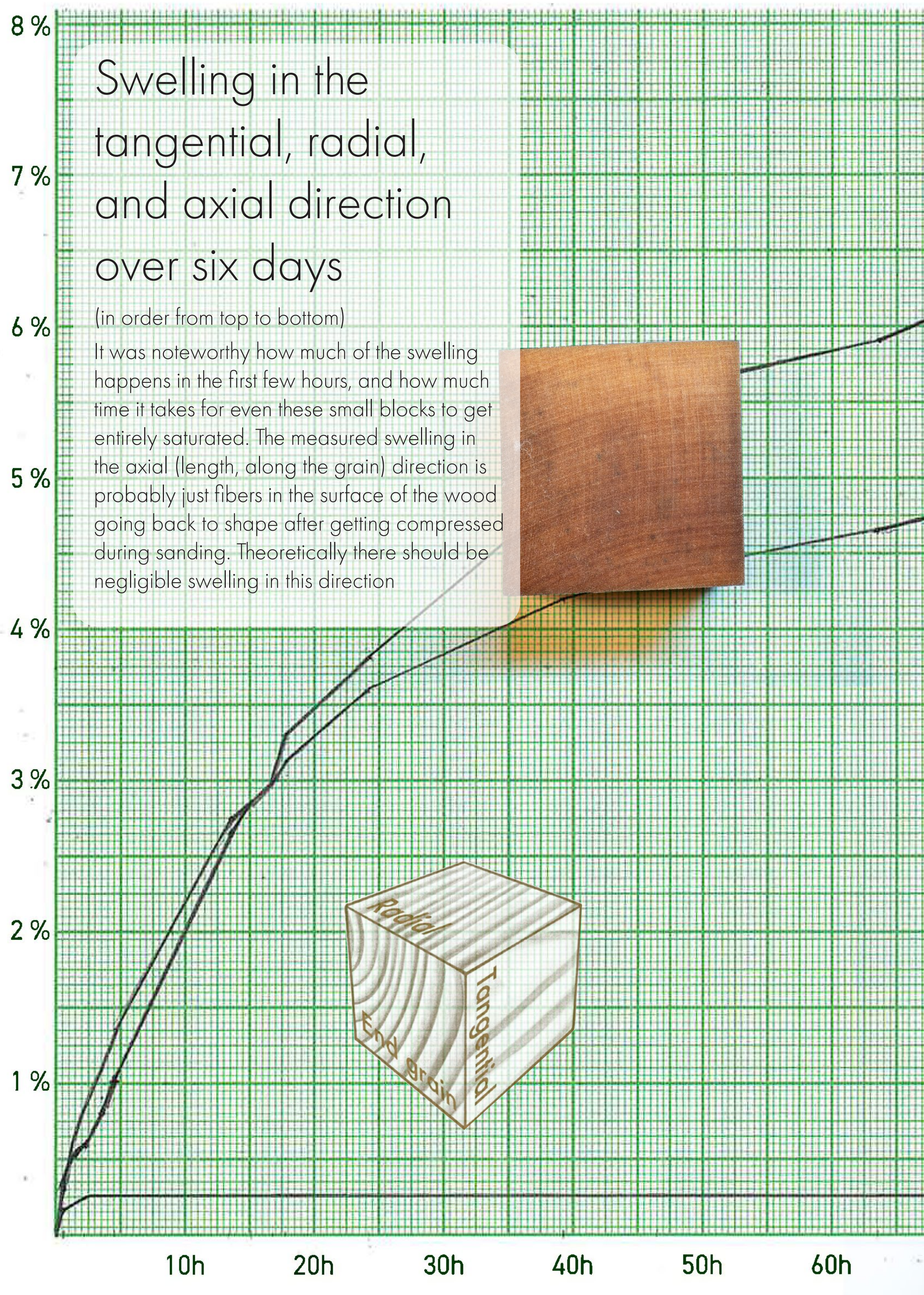
One of the basic properties of wood is that it is hygroscopic – it absorbs or releases moisture continually balancing the water content in the wood with the surroundings. As wood absorbs moisture this ways it swells, as wood is absorbed into the walls of the wood cells. When the wood dries again it shrinks back, and as long as there are changes in atmosphere the wood will be moving.

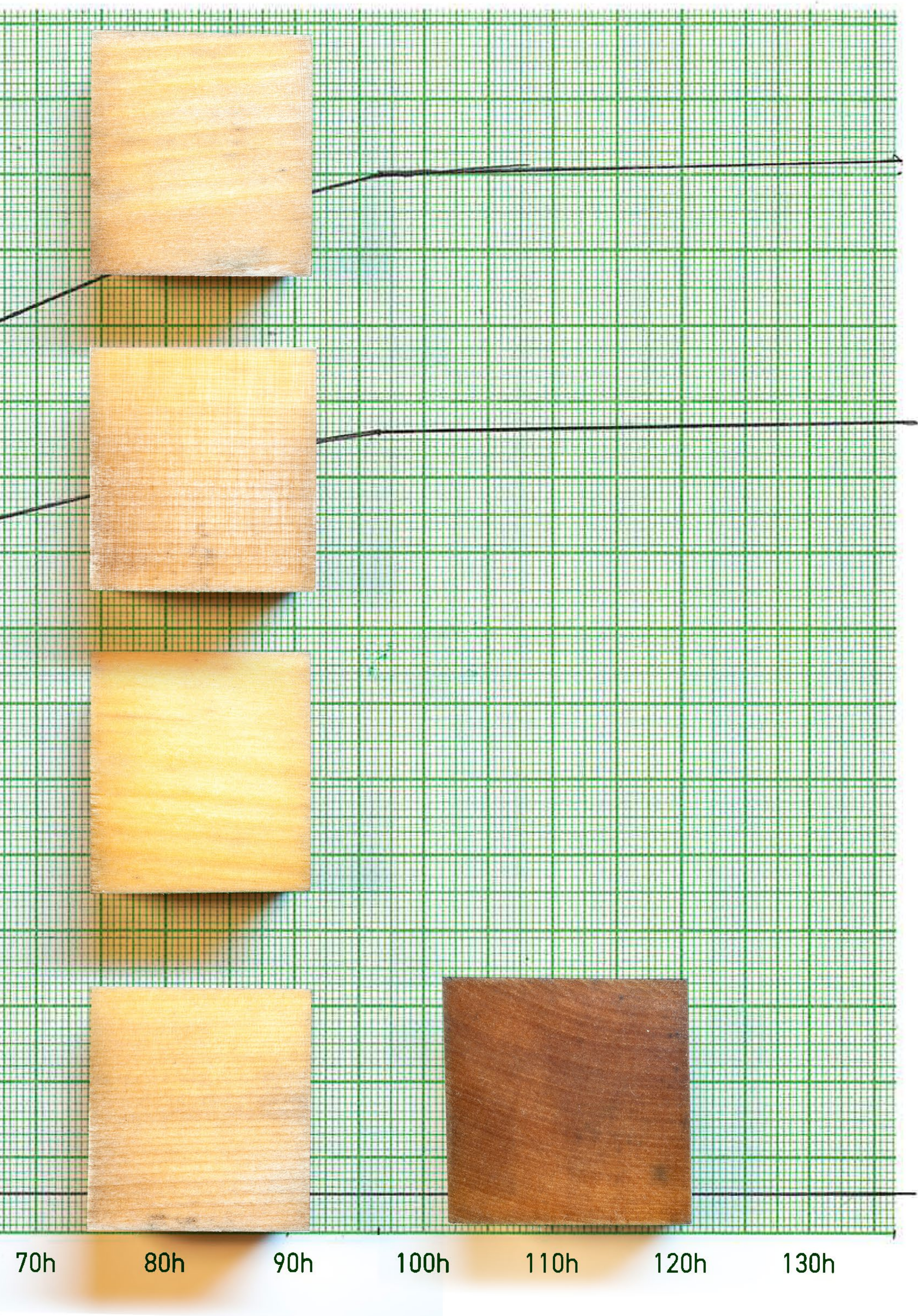
In the spirit of physical experiments I also started logging the swelling and subsequent shrinking of one of the produced cubes being soaked in water and then dried. This doesn't produce new data that couldn't be fund in a table, but even though I have access to those tables, and previous experience in working with the movement of wood, this provided a tangible experience of the phenomenon. This helped getting a sense of the geometry of wood movement, and can be recommended as fun little way of getting to know how wood moves.

Swelling in the tangential, radial, and axial direction over six days

(in order from top to bottom)

It was noteworthy how much of the swelling happens in the first few hours, and how much time it takes for even these small blocks to get entirely saturated. The measured swelling in the axial (length, along the grain) direction is probably just fibers in the surface of the wood going back to shape after getting compressed during sanding. Theoretically there should be negligible swelling in this direction




70h
80h
90h
100h
110h
120h
130h

7 weeks,
7 concepts

W. 1 Container

16.1. - 21.1.

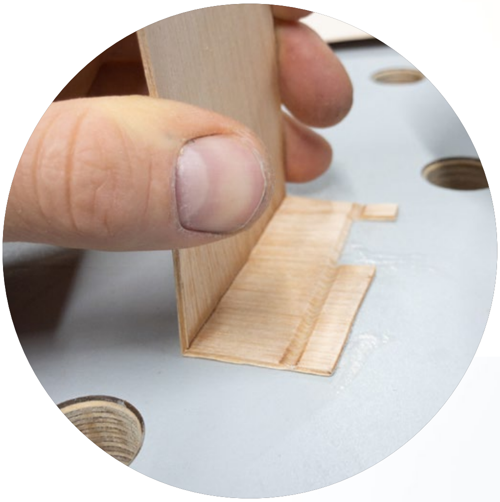
I started this first week with the value of «containing» and an interest to work with «mono-material» - and as an approachable product to apply that to I chose boxes. My approach through the week was threefold: determining the type of material, the size and proportions of boxes, and joining method. The week was cut a bit short by being the start-up week with some formalities and information to get out of the way.

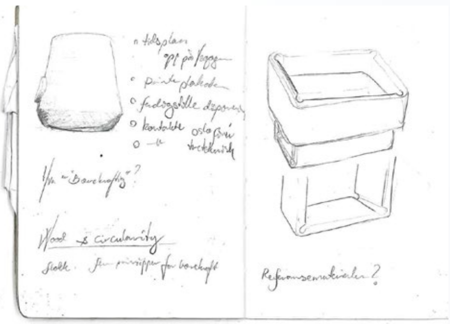
The material choice was done as a mind-mapping exercise combined with a sanity check using literature to verify the embodied energy[1] of different wooden materials - ranging from paper and MDF through particle board, plywood to solid wood. No rigorous calculations were done, but the reading was done to get a sense of scale.

The second part of determining scale and proportion was done through using an existing cardboard box as a starting point, then creating variations over that size from cardboard with a CNC knife cutter. This made it possible to precisely produce small variations on proportions with all details remaining the same.

The mock-up-work in (repurposed) cardboard was followed up with experimenting with how to fold solid wood. First approach tried was milling out a semicircular groove across a sheet of thick veneer (1,5 mm), then soaking the veneer in boiling water, and freehand bending the form. This first approach tried worked out so well I decided to go with simplicity this week, as much of the time was spent on research for the following weeks.

1 Berner-Lee, M. (2020)




tidsplan
Wood & circularity

W. 2 Spoons – hydroscopy

23.1 - 27.1.

The product goal for this week was making an alternative to the classical disposable yoghurt spoon. The large amount of engagement the switch from plastic spoons generated last year made this an intriguing topic to explore, and as an species of wood that is flavorless, easily moldable and abundantly available birch should be a suitable material for this application.

The experiments of this week has consisted of exploring «densifying» wood, developing a method of joining a two-part spoon together, probing opinions on the existing products, and putting the findings together in a product.

The first experiment was an attempt to address two identified problems with disposable wooden cutlery: the «mouth-feel» and the tendency to flatten when they comes into contact with moisture. Both of them are related to wood being hygroscopic.[1] This means wood absorbs moisture from the surroundings until a balance is reached between water in the cell walls of the wood and in the environment around it. This makes the wood swell, expand and distort, softens it somewhat, and can make it return to its original shape if it previously has been form pressed.

Compressing[2] and heating[3] is already in use for reducing wood's sensitivity to water. I wanted to experience for myself wether this could be feasible for producing single-use utensils, and what that process might involve.

The setup for the experiments involved a set of birch disks, each 40 mm in diameter, 1,4 mm thick, all cut from the same sheet of birch wood in order to ensure comparable properties. The samples were compressed using a 5 tonnes hydraulic press between steel plates. The steel plates were for some of the repetitions heated to various temperatures, as were some of the wooden samples. Some samples were soaked in water before pressing, and the time each sample were pressed for was varied. The applied pressure was kept consistent.

Each sample was observed and compared during the execution of the experiment, and at the end four representative samples for various treatments (hot, cold, wet-pressed

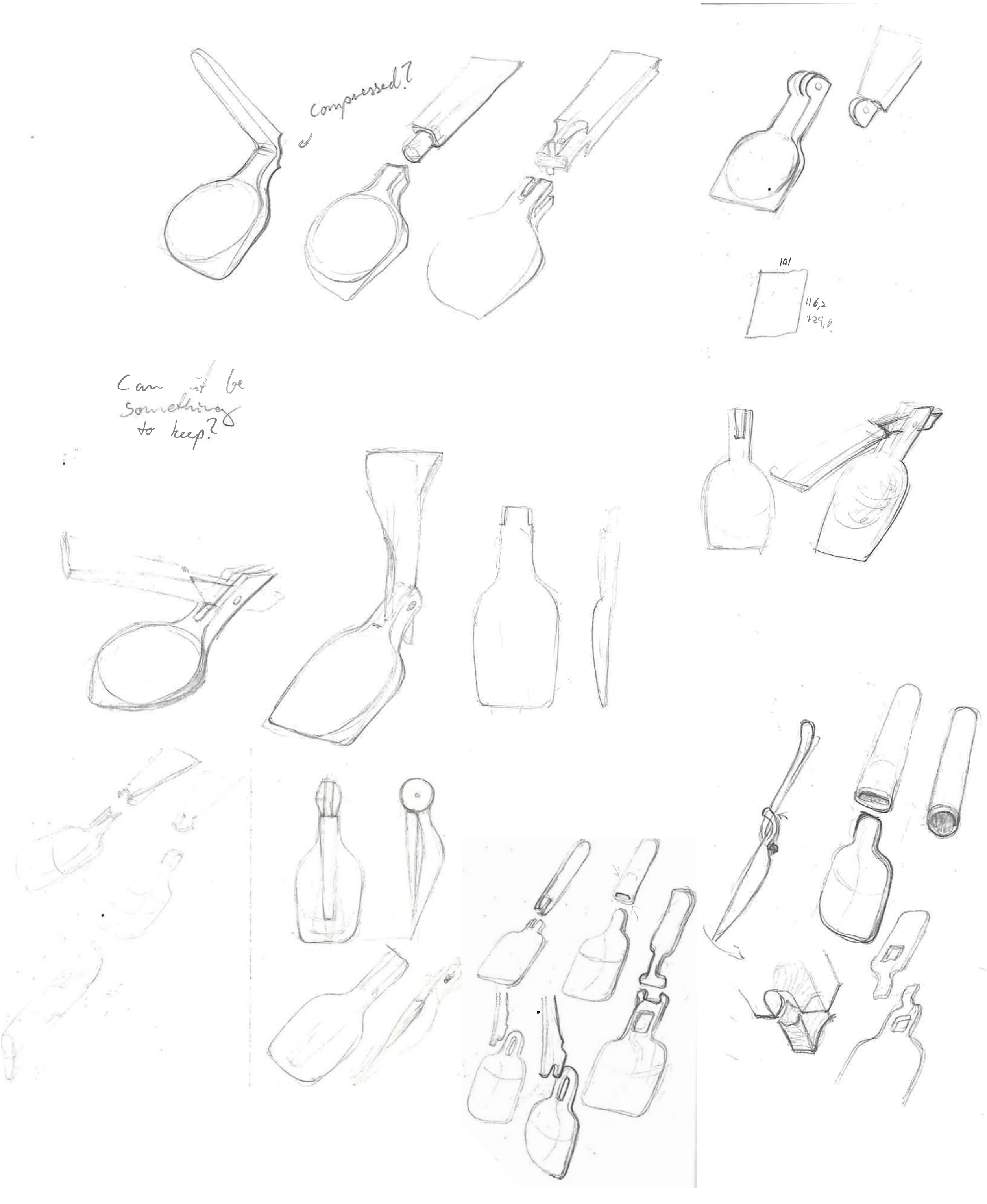
1 Kucera, Bohumil, Næss, Ragnar M. (2010) p. 223
2 A technique used to make "lignostone" for more than 100 years by https://www.roechling.com/
3 Ruponen, J. et al (2015)

and baked at higher temperature) were repeatedly dipped in water and measured to see how fast (if at all) they returned to their original thickness. This served as an indicator of how quickly a wooden spoon treated the same way would flatten and become «woody» in the mouth while eating.

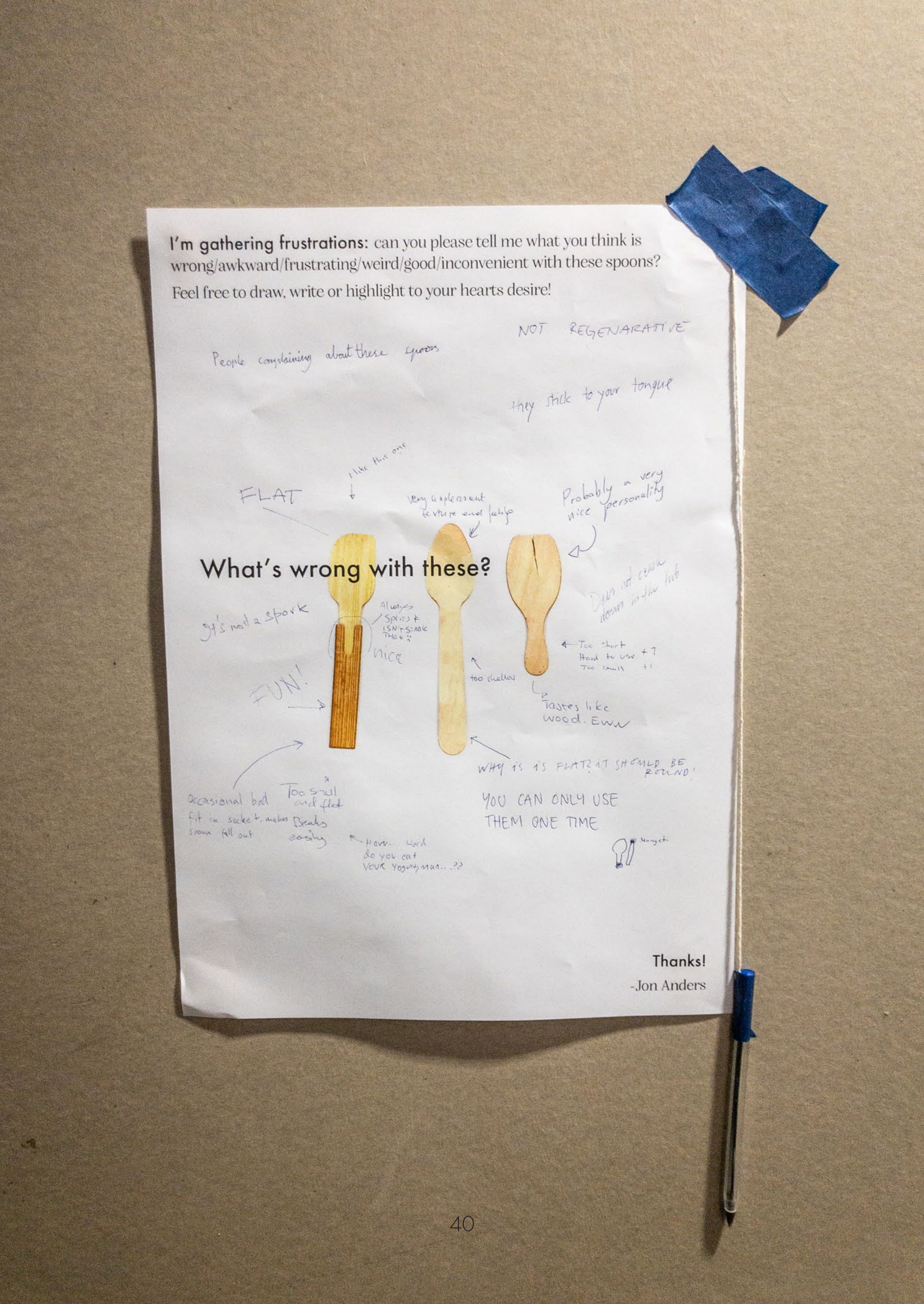
The outcome of the test showed little permanent effect of the treatment, other than for one sample that was baked at a sufficiently high temperature to give the wood a burnt odor. Other samles did show some promise, but as the time for the experiment was limited, the only real conclusion of this part is that ***more research is needed***.

Besides that, the experimentation did provide a direction for part two, developing a strategy for joining. This work started out with a session of loose thumbnail-sketching informed by a gathered set of disposable cutlery. The concept evaluation and selection from this was done with feasibility of efficient production, rigidity in use and ease of assembly. The first experiment was informative in showing the potential of using wood almost like a memory alloy, and a joint was drawn where the swelling and distortion of the wood would help retain the two parts. The conceptualization was quickly followed by testing various ways of forming the moulded joint, iterating formal expression hand in hand with proposed production techniques. This was done in order to incorporate the imprint of the tools positively in the form of the finished product.

The third part of experimentation was about probing for opinions on the existing product offerings on the market. As for many of the other experiments, this was done in a relatively low-threshold maner. A couple of posters were produced, each asking for opinions on some various wooden single-use cutlery. They were posted on various location, each with a pencil on a string attached, and observed over time. It took well over a week before much investing insights started appearing, but left up the posters have continued to produce interesting small insights during the duration of this project.


Compressed?
101
116,2
124,0
Can it be something to keep?

Two-part spoons with one-part mould for forming joint feature on the handle part.


I'm gathering frustrations: can you please tell me what you think is wrong/awkward/frustrating/weird/good/inconvenient with these spoons?
Feel free to draw, write or highlight to your hearts desire!
NOT REGENARATIVE
People complaining about these spoons
they stick to your tongue
I like this one
FLAT
Probably a very nice personality
What's wrong with these?
It's not a spork
Always splits & isn't stable
nice
Too short
Hard to use +1
Too small +1
FUN!
too shallow
Tastes like wood. Eww
WHY is it FLAT? IT SHOULD BE ROUND!
Occasional bad fit in socket, makes spoon fall out
Too small and flat
Breaks easily
YOU CAN ONLY USE THEM ONE TIME
How... Hard do you eat your Yogurt, man...??
Thanks!
-Jon Anders

I'm gathering frustrations: can you please tell me what you think is wrong/awkward/frustrating/weird/good/inconvenient with wooden utensils?

Feel free to draw, write or highlight to your hearts desire!

Absorberer mat og tunge.

(De suger opp all fuktighet i munnen)

They absorb all moisture in my mout and everything tastes like sawdust.. the fork cant stab/pierce the knife cant cut and the spoon doesnt "spoon"

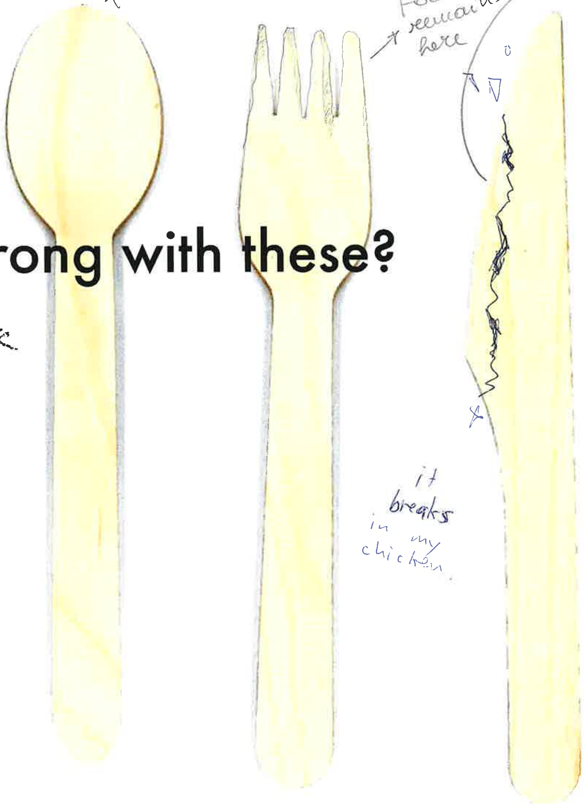
Disconnected from the forest!

DET ER EGT IKKE MER MILJØVENNLIG ENN PLAST. #GREENWASHING

Food remains stuck here

Not enough blade

Not sharp enough



What's wrong with these?

The taste

gets wet

it breaks in my chicken

Cant cutt stuff

Taste

So soft.

Easy to broke.

Thanks!

-Jon Anders

W. 3 Lid - tactility
30.1. – 3.2.

This week's focus is based on the EUs focus on product packaging as a source of waste.

"each European generates almost 180 kg of packaging waste per year." [1]

There are multiple ways of addressing this - the main ones being reducing the mass/amount of packaging on each product, and making the packaging something of value beyond the initial task of storing a product, thereby extending its life. From this I wanted to explore if substituting the metal lid on glass vessels for a wood cap could make it more appealing to keep long-term. As use case for this I chose a spice/herb glass, typically sold with a plastic lid. This is an example of a product where both the option of buying a new glass each time, and purchasing refill bags are available in most stores, but where refill is not significantly cheeper than a new glass. It is also a dry product, with makes the technical requirements less demanding.

The exploration of this week is also about how new modes of production facilitates new variants of established products. Since wood cannot be moulded or stamped like plastic or metal, and threads are a relatively complex 3D feature, industrially made threaded connections in wood has typically been made with plastic or metal inserts. CNC machining has made direct milling of threads in wood possible, at a scale and price that could be feasible for product packaging. This will increase the prize compared to injection-moulded plastics, but is economical cost is the only factor to consider, as long as the difference is not prohibitively large?

1 European Commission (2022)

The primary experiment for this week would be exploring forming threads for joining wood and glass. The proposed method is using a CNC mill to form the threads in the wooden part, but the school's workshop does not have access to the proper software or tools to do this. In order to experience the production of the threaded caps I therefore emulated the process with a machine lathe. This is not equal to CNC milling, but combines the same challenges of gripping the work piece, order of operation, and delivers a comparable end product. I therefore felt it was a valuable substitute.

Each iteration of the product form involved making multiple tools/bits for gripping the work piece, and the experience of figuring this out was informative for forming the product itself. There is no product without a working production process, and at this scale each operation should be a contribution to both form and function. At the same time the hands-on approach gave ample opportunities to consider the relationship between grain and form.

A side focus during the making of this week's product has been patina, a value that I'll return to later in the project. Designing products for longevity means wear and tear needs to be part of the consideration. The three most viable ways of managing wear is to make the product as hard-wearing as possible, make refurbishing easily accessible, or design it to age gracefully, to design for patina. Neither wood, paint nor plastic are particularly hard, and repairs or refurbishment is not something to expect for simple everyday objects. Wood does however have a history of aging gracefully, as can be seen in museums and antique stores.

Patina is a form of degradation, but one that is perceived in a positive way. To borrow from a treatise on concervation practices, we can "distinguish as the ancients did, between aerugo nobilis or ***"noble patina"*** and virue aerugo or patina that is destructive either visually or physically or both".[2] Patina in its ideal form makes the degradation of the object over time valuable. The value created is not reproducible without the aspect of time

2 National bureau of Standards (1977) p. 77

and use, creating an element of scarcity. This way value is created through keeping the object over a longer time.

A prerequisite for this to work however is that the expectation of a perfect finish on the product is not too high to begin with. «Newnesses induces the rapid obsolescence of a product» [3]

When a surface is perfectly lacquered to begin with the first blemish stands out in starch contrast, making the product «damaged» or «worn out». As an attempt to avoid this I decided on leaving the cap of this week unfinished, or treated with a neutral wax. It will pick up some stains, but the hope is it will "stand the test of time by recording transitory signs [without] loosing value"[4]

To aid in this the cap is given a generous convex side profile. This profile is tactilely pleasing, while making the corners less susceptible to nicks. At the same time it is symmetrical and provides a positive grip in production, easing milling of the threads. The edges between the side profile and flat top/bottom defines the form, and will pick up a bit more wear and patina over time, providing character. I also propose choosing lesser grades of birch wood for this, that otherwise would be discarded because of knots or deviating grain. Because of the small size and round form grain direction is of lesser concern, and deviating or curly grain would make the product more appealing and enhance notions of connection to nature.

3 Rognoli, V., & Karana, E., (2014)
4 ibid

W. 4 **Planter** – sustaining

6. – 10.2.

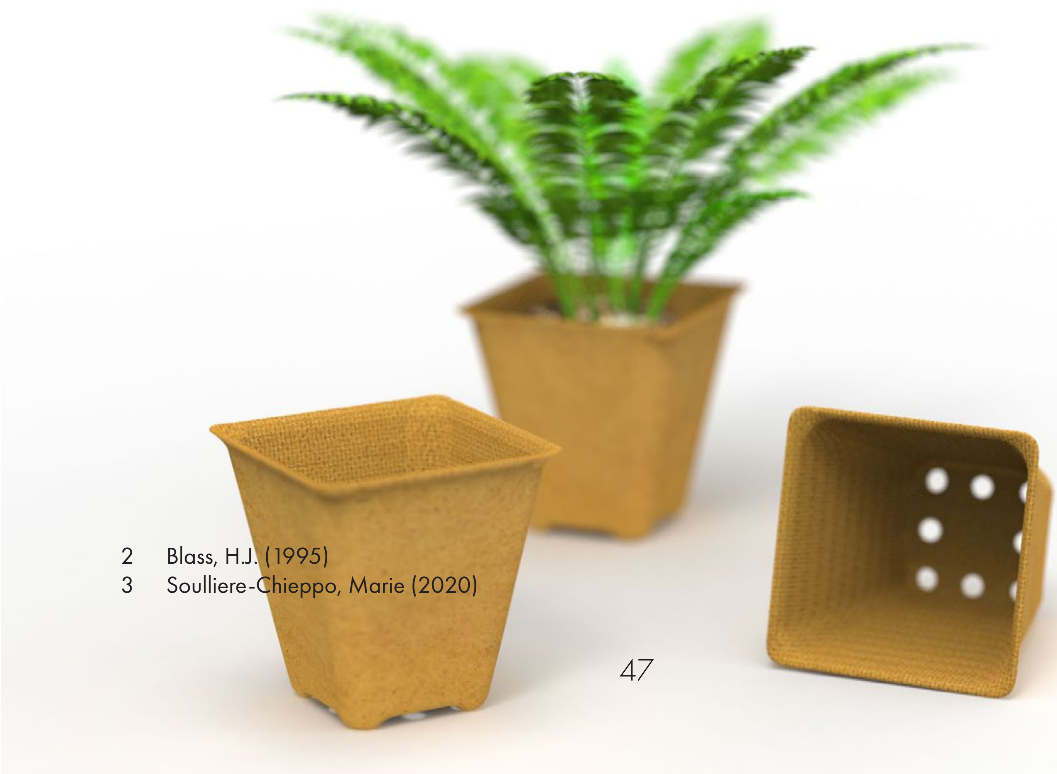
For this week I wanted to investigate another unsustainable, single use, plastic product. I identified plastic planters as a candidate, which are typically used for herbs and flowers bought from stores and garden centers. Most plants are sold in single-use, petroleum-based plastic pots or planters. Even though each pot is relatively lightweight, it is estimated that in the US alone, 750 million kg of plastic were used for plant containers in 2009 - a number expected to be significantly higher today.[1]

I started the experimentation by forming hollow vessels from flat veneer. I tested if the folding method established in week one could be combined with the wet-moulding of week two, without success. The hypothesis was that compressing a line across the sheet would make a de-bossed folding line as is often used on paper. However, my attempts only resulted in me cutting the wood pieces in two and after those preliminary tests, the technique was shelved in favor of a more conventional method using wet-moulded veneer with gentler corner radii.

Since the pots should be decomposable, plywood was deemed to not be an option because the glue used is non-biodegradable. Therefore, I tried forming an origami-style pot out of one sheet of veneer, with the grain going 45 degrees to all sides. This distributes the strength of the wood evenly across all four sides, avoiding folds parallel to the grain that could easily crack. A square, conical prism (frustum) form was chosen, both for ease of stacking and packing when filled, but also for ease of folding. Patterns were constructed based on some typical planters for store-bought herbs, and cut out on a laser cutter. Using the laser should eliminate the risk of cracks introduced in cutting the outline with a saw, knife or similar implements, ensuring an ideal test scenario. Holes were drawn at each end of every bending line, in order to avoid sharp corners where cracking could initiate. Soaking and wet-moulding over a convex form produced somewhat promising results, with the «bending-holes» seeming to line up well with the holes required for drainage, and the dried veneer form holding shape quite well. However, issues with forming interlocking geometry that is easily locked together without glue, and the finished pot cracking over the form as the veneer shrunk as it dried, led me to abandon this product. It is left as an example of the material being stretched too far into a role it is not suitable for.

1 Soulliere-Chieppo, Marie (2020)

If I were to suggest a way to a finish this product I would look to the Masonite-/ Huntonit-method, where wood chips are disintegrated in water to form a wet, fibrous mass. This mass is then compressed together over a form and heated, which softens the lignin in the wood and binds the wood fibres together.[2] This way wood can be moulded more or less like a polymer, without adding any resin or binder. The finished planter would also naturally decompose in contact with the ground, making planting easier.[3] This technique is, however, only in use for producing flat sheets at the moment, so there is a technological hurdle in the way. I've learnt through earlier correspondence with Huntonit AS that it might be feasible to mould wood this way, but the energy usage for disintegrating and then bonding the wood is significant. So other than a concept sketch I've not followed up on this further, even though this method might prove a sustainable way to get planters in the future.



2 Blass, H.J. (1995)
3 Soulliere-Chieppo, Marie (2020)

W. 5 Shelves – "bærekraft"

*Norwegian for sustainability, but could also refer to the capasity to support something, like a shelf does.

Disposability is not necessarily connected to the expected length of life for the product. The topic of this week started as a reaction to reading IKEAs announcement of ***«a new BILLY bookcase, more circular and affordable»***.[1] The article describes how IKEA has done three significant changes to make the Billy bookcase more sustainable. After reading the article, I decided it would be interesting to challenge those notions in designing an alternative shelf/bookcase system and use this opportunity to discuss IKEAs relationship to wood. This is not intended as critique of IKEA alone, but an argument around most mass-market production in that category, exemplified through the largest producer.

IKEAs first step towards sustainability in this case is to remove the wood veneer from Billy, replacing it with paper foil. The old Billy bookcase is made of 21 mm thick particle board, with half-millimeter thick veneer on top. They argue that replacing this wood veneer is a sustainability choice, probably because this reduces wood usage. Looking at table 5 from ***«Bjørk i Norge»***[2], one can argue that this in some ways is a sustainability choice. As only a very limited percentile of trees are suitable for veneer production, wood for veneer production is an easily depleted resource. However, veneer makes up very little of the mass of the finished product. Due to the thickness of veneer (half a millimeter) compared to the base material (21 mm thick), only about 4% of the finished product is wood in the form of veneer. Removing veneer is not significantly reducing the wood content of the finished shelves, but they are - intentionally or not - removing stress on a limited resource. However, if IKEA is replacing the wood veneer because they deem it more sustainable to use less trees, then perhaps focusing on veneer is looking at the issue from the wrong angle.

Instead of veneer, IKEA is going to use printed paper, and an important question comes to mind: what happens when these shelves are exposed to wear? The new surface is literally paper thin, and as soon as this surface is exposed to wear the underlying paper and particle board will presumably shine through.
In addition to the aesthetic drawbacks, the chipboard comprising the structural part of the shelves is susceptible to creep over time[3]. This means that even if the chipboard is comparable to solid wood in strength for short periods of time, long-term loads, like a shelf filled with books, can make the chip-board sag, even under loads much smaller than what you would

1 IKEA (2022)
2 Zimmer et al (2023)

3 Blass, H. J. (1995)

expect it to handle. This is not ideal for the sustainability of a bookcase that should presumably be made to last a long time.

One argument used to claim that chipboard is a sustainable material is that it can be recycled. As chipboard is just wood chips, resin (glue), wax and binders, wood offcuts and discarded wood products can be used indiscriminately. Chipboard itself can, supposedly, be ground up and glued together to make new sheets. However, the amount and type of glue added to this process is significant. Most chipboard is made with approximately 15% resin and binder, of which most is usually a type of urea-formaldehyde compound.[4] This means that after just four cycles of chipping and gluing new chipboard from old chipboard, less than half of the finished product consists of wood chips while the rest is glue. The fibers in the recycled material will also be much shorter than in chipboard made from wood offcuts. The excessive amount of glue and short fibers will severely worsen the strength of the recycled chipboard. Even if this is an edge case, the issue is still there, making chipboard an inherently non-circular material.

Another issue with chipboard is the off-gassing of formaldehyde from new sheets of particleboard, which is a known carcinogen.[5] However, harmful gasses are not only released when making the chipboard. If incineration is chosen as waste-disposal for the benefit of energy recycling, then NOx-gasses are released in significantly higher amounts than when burning wood.[6] NOx-gasses are known to have a negative impact on health, the natural environment and climate.[7]

These issues combined points for me towards solid wood as a better choice. Wood for solid panels and shelves have much less strict sorting criteria then dor veneer, meaning much more trees could be utilized, and the amount of processing of the wood would be much less. There would also be much less chemicals used, benefiting health and environment both in production, in use and after. The cost might be higher, which is a concern - and could be argued to negatively affect the social and economical sustainability. The question is though if we can afford the potential ecological cost of disposable chipboard furniture[8].

4 Blass, H.J. (1995)
5 Cogliano et. al. (2006)

6 Risholm-Sundman, M., Vestin, E. (2005)
7 Miljødirektoratet (2022)
8 It's worth mentioning that even IKEA makes affordable «sheet-form» furniture without using chipboard - see the «Lisabo» table range





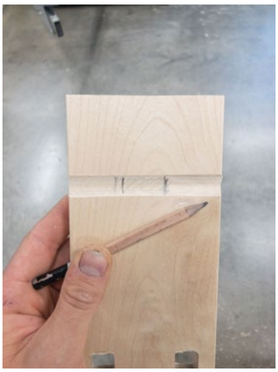




STOP











W. 5 Experiments

20.-24.2.

The experiments of this week centered on methods of joining wood for a flat-packable shelving system. Over some days in the workshop I made two sets of four joints each. As a starting point I used common joints like mortise and tenon-joinery and dovetail joinery, then variations on that classical joinery was developed from the experience of making the previous. The end point of this was two sets of four joints each, both in the form of mini-shelves, forming physical polar diagrams between metal hardware and all-wood construction, and conventional and more eccentric forms. These were then used for testing and workshopping with a few potential users. Throughout the process these test pieces proved valuable both for trying out new forms of joinery, and testing and discussing with potential users, as fun, small artifacts to play around with. The construction of the final, full-scale concept model did however prove that this form of model does not replace working in full scale, and multiple issues became visible in full scale that was not precent in the scaled-down version.

In the design of the full-scale shelves I opted to make the construction without a back plate, leaving them open. Typically in flat-pack furniture this back plate provides much rigidity and alleviates stress from corner joints - a necessity with less sturdy materials like chipboard. Making the shelves without the back plate removes the need for a large sheet of either plywood, fiberboard, cardboard or similar, and reduces packing size for transport. It also makes the shelves dual sided, giving the customer the option of either hiding or displaying the fastener wedges.

This week I also started experimenting with the term ***«Standard Unique»*** in the project. This is «a principle that deliberately embodies imperfections that are a result of production processes, assembly, and/or material properties to have unique objects as an outcome». Working with wood and other natural materials this is to some degree a necessity, as the material will never be entirely homogeneous. The approach of standard unique utilizes this as an advantage, enhancing the imperfections as a feature of the material. My introductory experiential experiment in this consisted of splitting up a board of birch of low quality, bought from the reject-stack at a carpentry workshop. The split segments from the bord was kept sorted by place in the log, and different rules for organizing the pieces into finished laminated boards was tried out. The result was a proposed re-sawing (splitting) and glueing strategy for more expressive materials, and a visual prototype of more «ornamental» or patterned birch wood. This chosen strategy was to splitt the wood into strips with the grain (growth rings) perpendicular to the surface, keeping pairs of «neighbors» together, and flipping them open like a book. They were then organized with the pair closest to the middle of the log at the center, and pairs further out in the log on each side - the end result being a relatively predictable color gradient from the dark center to lighter edges. The results gets better with a bit of manual sorting, but even strict rules-based sorting gave quite acceptable results.

W. 6 Stool – grown

27.2. – 3.3.

Nearing the end of the seven weeks of experimentation I wanted to use one week to focus on an interesting approach explored previously in the PhD thesis ***Reframing wood construction***.[1] When sorting timber for milling to solid wood materials, usually just the straight logs are kept, while crooked parts and branches are cut away, and used for firewood, chips or other processed wood products. But branches possess great potential for making strong yet slim constructions, as they are grown to handle the weight and stresses of foliage, snow, wind and rain without breaking.

Within the traditional paradigm for processing wood, where all is milled to straight planks in large saw mills, branches is considered a defect. There are currently no way for the saw to consider branches or other deviation from a straight log. But, with the emergence of digital manufacturing technologies, scanning entire trees and determining which parts fit in a given design is feasible.[2]

Looking at a trees there appears to be near infinite variation in branch forms, making repeatable, predictable products near impossible. The biomechanics of a growing tree do however provide some patters, meaning if a branch has the right angle it will most likely also have the right thickness ratio between the branches. It is also shown that most species of trees has a relatively limited range of variation in variables like branching angle.

For this experiment I decided to focus on the material and not the technological side, as time is limited and material the overall focus of this diploma. The technical aspect of working with form-grown wood branches, 3D scanning and CAD based on that is covered and evidenced well by among others Marcin Wójcik in his PhD thesis Reframing wood construction and the project «Bandsawn Bands» by Ryan Luke Johns & Nicholas Foley.

1 Wójcik, Marcin (2020)
2 Scanning is to some degree in use already for wood processing, where cameras and image-recognition software in the saw mill identifies knots (remnants of branches) in the wood and other defects for sorting the wood and sawing better planks.

For this week’s concept I decided to make a stool, an object you have to trust with the weight of your own body in order to use it.

I chose a rounded, convex form for the seat in order to show the greatest and most even display of wood grain. For the same reason I picked flat-sawn («tangential» grain) materials for the top. This will make the top a bit more susceptible to warping, but stability is not of the greatest importance for this form, as it is not flat to begin with. Some of the potential for movement is also cancelled out by flipping the two halves of the seat opposite ways. This also helps the flow of the ornamental grain in the top piece. The form is made to allude to the canopy of trees, connecting the object to the material, and linking it to the intent of utilizing branch wood.

The legs are from branches split in two, to retain some symmetry. This splitting along the middle also helps prevent splitting, and reveal interesting grain patterns in the merging section of the two halves. This further shows the ornamental act it is to work with wood.

The stool is made with three legs both for its visual intrigue and for stability, as an object with three points of contact won’t wobble. The three legs help avoiding waste in being able to utilize halves that lack a mate.



W. 7 Bowl – patina

6. – 10.3.

The intention of the week is to investigate surfaces in relation to the material beneath. The chosen product of the week is a bowl - a typical piece of «styling accessory» that could be seen together with furniture like the result of the last two weeks. This is typically things made to be a bit more expressive, an accent to the interior, but also be easier to replace – a bit more disposable than the larger furniture pieces. The goal of this week is to make something that is both disposable in the sense that it is decomposable, has a small ecological- and carbon footprint, and relatively inexpensive. But it should also be made to last, both in being relatively sturdy, but also with surfaces and features that age gracefully. In that sense the goal is to make it feel non-disposable, becoming more desirable with age.

Patina can be valuable in forming a connection to a product over time, and it can be facilitated through choosing a material that is sufficiently susceptible to degradation over timePatina can be valuable in forming a connection to a product over time, and it can be facilitated through choosing a material that is sufficiently susceptible to degradation over time.[1] In addition to the material being «soft» enough to take on imprints of time passing, potentially becoming a repository for memories. The material should have depth, and not reveal a lesser inner core, even through a lifetime of wear. One should be mindful of sharp edges, as they can be easily chipped, but they could also be used strategically as they quickly take on wear. Reflecting this I have developed a form with a robust radii on the most exposed part of the outside, but sharper edges around the rim and the base. The underside is flat, and lightly sanded to start the aging process. The inside surfaces is bare wood, with just a subtle wax coating. It has flat sides and bottom with a generous fillet joining them, letting the grain pattern be the main attraction.

1 Adamson, G. (2018) p. 144

untreated

sand blasted


through dyed, from Studio Sloyd

hardwax oil

linseed oil


Linseed oil, colored


hardwax oil, pigmented

linseed oil paint


lime-casein paint


potassium permanganate


iron (II) sulfate


charred




As a way of working with the aspect of time I have also been evaluating old examples of treated birch wood. I brought an old serving tray made from laminated birch with me, visiting cabinet makers and other craftspeople I spoke to during this exercise. It was once treated with a clear varnish, that has worn of in large areas, and that served as a good conversation starter. We talked about their experiences and preferences in surface treatment, which greatly helped my choice of surfaces to try out.

I chose to use the cubes from W.0 , where I had explored the relationships between form, surface and grain, for trying out surface finishes I had determined to have potential for patina. I have tried out a range of finishes and treatments from chemical patination through some different paint options, and made a set of samples with those that showed the most promise.

I do not have room for describing each one, but will go a bit in depth on the one I ended on. Lime-casein paint («milk paint») is an old form of paint, made from milk protein, lime powder, water and pigment. It works well patina and graceful wear, as it isn't forming a film on the surface to the same degree that acrylic and other modern paints do. Instead a thin layer of pigment is bonded directly to the substrate (wood), with a content of just 2 % binder in the dried paint, the remaining 98 % being pigment. This makes the wood structure clearly visible through the finish, and the paint won't chip of in flakes, instead wearing of gradually forming gentle gradients.[2] For lime-casein paint the low binder-content has the added benefit of making a really matte finish, that can be further adjusted for gloss with a bit of wax or oil. It also makes the paint incredible cheap to make.[3] There are some uncertainty around what types of paint were actually traditionally used for the types of furniture that now turns up with a rich patina in antique-stores, but both linseed oil and casein paints were most likely commonly used, and both have comparable properties to other paint types of that age.

2 Schwarz, C. (2019) p. 604
3 Kremer (2018) p. 56

Conclusion

Conclusion:

the Chair

The choice of product for the last module was both quite difficult and a relatively easy one. The intention of the format of this project was that this product concept should serve as the conclusion of the seven (plus some) weeks leading up to this. It needed to be one of sufficient yet manageable complexity, connected to the values of the project and learning outcomes from the earlier weeks, be of use for showcasing different properties identified from the work so far. Both the interview with Sverre Uhnger and Mikkel Jøraandstad's diploma «A good chair» has influenced me on both the complexity and the communicative value of chairs. As chairs are the near archetypal example of «furniture» they also seem representative of the wast amounts of disposable stuff we surround ourselves with.

I was quite clear after finishing the first seven weeks that I wanted to incorporate a form-grown element like in W. 6, and from the interview with Sverre Uhnger[1] that the chair should be stackable. It should also be possible to make without metal parts, in order to be able to approach the concept of carbon-negative furniture. I have however not done the calculations necessary to claim anything about the carbon footprint for this chair.

In the ideation phase the form-grown element and stackability were tested and evaluated through a mix of digital and physical mockups, working progressively in scale from thumbnail sketches to a full-scale mockup before committing to the final material.

In working with a form for this chair I opted to move somewhat away from «the square» and traditional forms in order to push both the material and myself. I wanted to go back to the start and challenge the notion of «wooden», but also challenge the traditional craftsperson in me that has a love for the classical «carpentry» form of relatively square chairs with just subtle nuances in angles and joinery.

1 See appendix I


aim somewhat conventionaly
to underline feasibility
Rapport
Process

Production

At the same time as I wanted to make the form less "square" I opted to keep some notions of traditional joinery. This was a strategic choice to root the product in the known and plausible. This was an effort to work within the range of MAYA (Most Advanced Yet Acceptable), balancing the more radical elements of the form. The «knee» of the front legs is the most visible example of this, being a merge of modern finger joints and traditional tenon joinery. Being conical in cross-section helps with the strength in an exposed part of the chair, while the simple form isn't too distracting from the overall form. For the same reason I placed the grain flat so that the growth rings flow near seamlessly across the knee.

The other joints between the grown back leg and the seat and back rest are made so they can be milled from one side with a conventional 3-axis CNC mill based on a scan of the branch. The edges around these joints are gently chamfered to account for any misalignment. Making the sides of the branch flat helps keeping the overall form of the chair balanced, and serves as reference surfaces for machining and assembly. The decision not to split the branch in two halves also helps with symmetry, and lets the branch keep some more identity and «naturalness». All parts are made to be well suited for assembly with just glue strengthened with dowels, but could also easily be adopted for flat-packing with some metal hardware. Deciding between those two options would require a case study of transport between production and end user, which has not been done for this project. The Minus-chair does however show some precedence for transporting assembled, stacked chairs instead of flat-packing.

Into the woods

on sustainability

(what about deforestation?)

Making products from wood necessarily involves cutting down forests and this is a commonly cited concern when wood in the context of sustainability is discussed. Worldwide, deforestation is a significant issue, so much so that the number one goal in the UN's Global Forest Goals Report of 2021 is to ***«reverse the loss of forest cover»***[1]. This is a global issue that most people feel they can experience in their everyday lives - most that have spent some time in nature have seen traces of forestry. In many cases, and most visibly, in form of clear-cut openings in the forest that feels like a symbol of the carnage civilization can inflict upon nature. But deforestation has multiple causes:

- Agriculture
- Construction and
- Infrastructure
- Logging without reforestation
- Mining
- Wildfires

What differentiates planned logging from most of the other causes of deforestation is the obligation to re-plant[2], which the UN is actively working to promote. In Norway this is a legal requirement after logging[3], but when woods are removed for other purposes, the area is redefined and regeneration will not occur. A forest is at its most productive, i.e. capturing the most carbon, when it is actively growing[4], hence active forestry is probably a more effective carbon storage strategy than just leaving the forest. When the forest gets old it enters a more stagnant phase where less carbon is stored, so the amount of living biomass in an old forest is relatively stable. As the trees in the forest decomposes, carbon is released. Thus, might it not be better to remove the old trees before they start decomposing and plant new trees which will immediately start absorbing and storing carbon?

However, there are a few complicating factors. Sustainability is a much broader problem than carbon emissions alone, and forests are valuable for their biodiversity, but also more intangible values like recreation and health. A relatively small patch of **«nærskog»**[5] can have a significant value for public health[6], but this value is hard to quantify and is therefore a potential source of conflict. Biodiversity has value on its own, and there is a growing consensus that the climate crisis cannot be solved without considering the linked crisis of biodiversity loss and the destruction of nature. There is also too little knowledge on the development of the carbon storage in old forest ecosystem.[7]

1 The Global Forest Goals Report (2021) p. xi
2 Or regenerate the forest, there are multiple methods

3 Skogbrukslova §6
4 Nearby forest or neighborhood forest
5 Hessen, D.O. (2023)
6 Brunner, A (2022)
7 Svensson, A. Dalen, L. S. (2021)

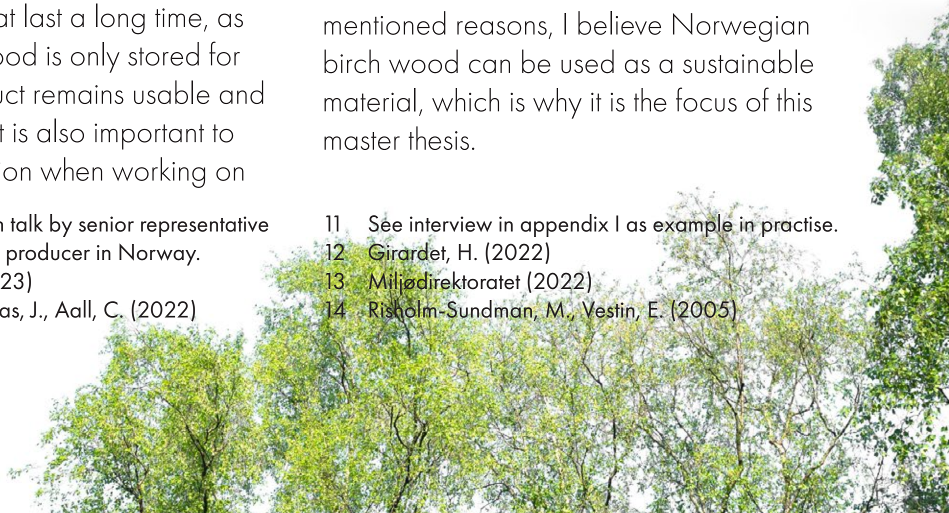
The potential loss of biodiversity linked to forestry has led to questions about, among other things, whether wood from Swedish forests can be considered a sustainable resource. More broadly some even ask whether wood can be considered sustainable in general.[8] However, wood is a local resource, so the question of sustainability comes down to local considerations. For instance, some of the research that questions the sustainability of Swedish forestry points out that the situation in Norwegian forests is significantly different, and that Norway still has an untapped potential for harvesting biomass (timber) in a sustainable manner to offset carbon emissions. [9]

If we use carbon as a metric for sustainability, then wood has a greater impact when replacing carbon-intensive materials. To gain the climate benefit from making products out of wood, it is imperative that products made from less sustainable materials are replaced.[10] Research shows that most wooden materials are equal to or better than comparable building materials like concrete, polyurethane and steel. From a greenhouse gas perspective, what you replace is more important than what kind of species of wood or wooden material you use to replace it with.[10] It is also important to make products that last a long time, as the carbon in the wood is only stored for as long as the product remains usable and is not disposed off. It is also important to consider transportation when working on choosing the most sustainable material, as transportation is shown to be the single most important factor for climate gas emissions in (building) materials.[10] This shows the importance of considering wood (and other materials) a local resource.[11]

However, it is also important to differentiating between operating within the biosphere versus the technosphere[12] when working with wood. Natural materials (biosphere) have the benefit that they can decompose and in essence be recycled by nature, given time and the right handling of the material. If those materials are «elevated» into the technosphere, by being treated or mixed with plastics and other non-biodegradable materials, then the only way of managing those products are to keep them in the technosphere, spending more energy and resources at each step. In addition to this, glue and other materials used together with the wood can severely limit the circularity of the end product, as discussed in chapter W.5 Shelves, in addition to associated emissions that can negatively impact human health, nature and climate.[13 14] This is not sustainable.

Sustainability is a set of complex considerations, often dependent on both questions of value judgment as well as numbers and calculations. But for the above mentioned reasons, I believe Norwegian birch wood can be used as a sustainable material, which is why it is the focus of this master thesis.

8 Opinion expressed in talk by senior representative of one large furniture producer in Norway.
9 Blattert, C. et al. (2023)
10 Simonsen, M., Kjønaas, J., Aall, C. (2022)
11 See interview in appendix I as example in practise.
12 Girardet, H. (2022)
13 Miljødirektoratet (2022)
14 Risholm-Sundman, M., Vestin, E. (2005)



Final thoughts

Glenn Adamson argues for relics as an «important way we can infuse our lives with meaning». Transposing his argument into the context of my diploma, any wooden object has in it the potential of being a relic - as "all that is left" - of a tree. I believe wooden objects have a strong potential for being everyday relics, objects that possess greater meaning than the superficial role of that product. The grain of the wood is in itself a recording of decades past, and as I have discussed wood has great potential for developing a «noble patina» – if it is used well. But working with wood that has spent decades growing before being cut down, there is also a responsibility to make «good» things. Master cabinetmaker Bjørn-Gunnar Eliasen states that «the furniture should last (at least) as long as the tree has been growing in the forest.» This implies a product lifetime of at least forty to seventy years, and well past hundred for oak furniture. I don't believe all products should be measured by this standard, but it is worth being mindful of.

At the end of this project I see the engagement and all the interesting conversations the concepts I have made as a sign of success. Physical artifacts has a significant value. The act of making them teaches more than can be expressed in words, and I believe my approach of integrating more physical product in the «Material driven design»-framework has been valuable. The framework for how I have done it could be improved, and I believe (among other things) a focus on more related group of products could be a good approach. However, seing at the end how none of the concepts would have looked the same without the ones made before them proves to me that the process have worked.

Manifesto![1]

I (still) prefer solid wood over laminated wood[2]

laminated wood over plywood[3]

plywood over particle board[4]

particle board over veneered anything[5]

anything over synthetic imitations[6]

– and remember –

choosing visible wood is an act of ornament[7]

small conscious actions makes you mindful about the decisions that makes a big impact.[8]

experiment to get out of a mindset, not validate one

other materials are alright too

(ocationally wood is not the answer)

if the answer is particle board you didn't ask the right question

trees do not grow into straight, square planks

patina over the gloss of newness, anytime

wood is a local material![9]

and any rules should be challenged.

1 This is a manifesto for the end point of this diploma. As manifestos are it is bold, exaggerating some of the findings of this diploma. As manifestos are somewhat foreign in this format, it can also be regarded as a hypothesis through statement, and as such, it is made expressly for being challenged through the process onwards. This diploma is at its delivery date, but the process of learning about materials through using them is lifelong.

2 There are good reasons to laminate - both to save materials, increase strenght ect.. But lamination necessitates glue and processing, increasing both price and ecological footprint

3 Plywood requires more glue per mass unit of wood, and necessitates a much more restrictive sorting of the raw timber (Zimmer et al 2023 p. 15)

4 Particle board (and MDF) requires even greater amounts of glue, and further alienates from the material as found. It also removes further more of the inherit challenges in the material, taking away some of its formal identity.

5 There is an element of occlution and tricery in veneering. I don't propose that veneering is inherently bad, but that my preference is to avoid it, sparing it for only the occations where it is genuinely neccesary. The life expectancy of the product should be carefully considered, and it should not cover over chipboard.

6 See picture of emotional starting point of this project. This statement (may) involve an element of snobbery and elitesism, and there are good reasons to immitate materials, and plenty of good historic examples of valueable imitations. But I find that the bad examples outnumber the good to such a degree that I want to avoid immitations as far as possible. Or until there is a really fun reason not to.

7 Adolf Loos is well known for stating"Freedom from ornament is a sign of spiritual strength" (Loos, A. 1998). As Trilling (2001, p194) point out Loos himself was central in working with material based ornaments like marble. As Loos himself couldn't avoid ornament, it is unavoidable when introducing visible wood grain. See also reflections from week 0.

8 See reflections from week 1 through 7 for this and the next 6 lines

9 See interview with designer Sverre Uhnger on "Minus" in appendix I

Personal reflections

I see it as a necessity to re-evaluate our relationship to stuff. Our professor in art history during my second semester at AHO stated we live in a “bulimic consumation culture”, and what seemed an interesting argument at the time has gotten to me more and more during the years that followed. This semester has been an oppurtunity to wrestle (a bit) with that, but I can’t say I’ve found, nor expected, concrete, simple ansvers. We need to make good products, at an apropriate scale, that fulfills other needs than just profit. We have to make them from good materials, that could be birch or something completely different. But those considerations needs to be done for every and each project - and answers needs to be questioned. Making products is a tremenduos responsibility.

Thank you

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My parents for raising me to see the forest for all those fabulous trees and all the other wonders therein.

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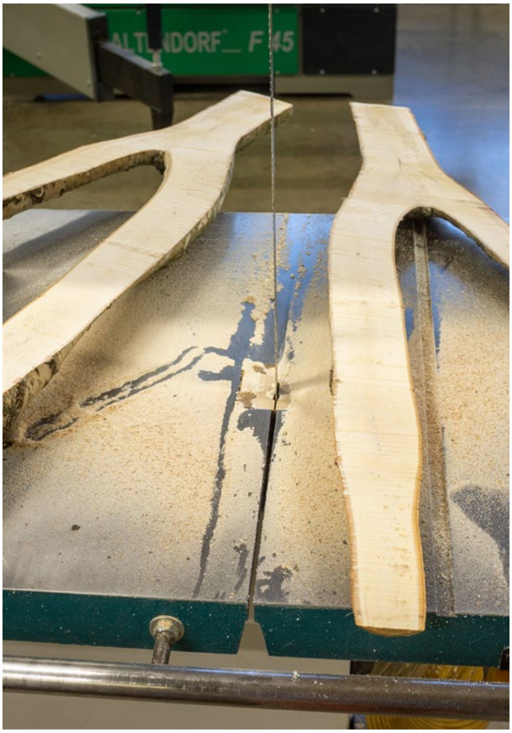
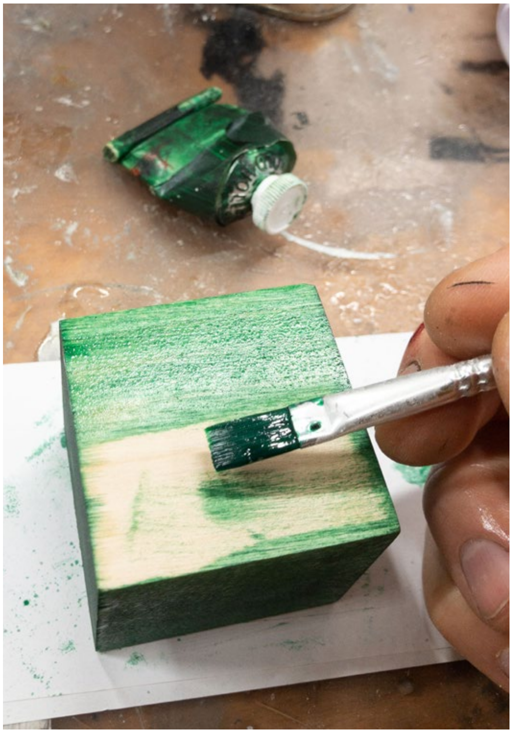
Finally thank you Frøydis. For supporting me and believing in me, and helping me believe in myself. And for help editing and proofreading and hundreds of smaller things, but most importantly motivating me throughout the final few years of my time as student at AHO.








3
Heated & Dry
4
Soaked
+Hot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