ODD NEW SPRING: TOWARDS EVOLVING LAND-SCAPES AND A REORIENTATION IN DESIGN PRACTICE

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Reflection component of PhD in Artistic Research at the University of Bergen, Faculty of Fine Arts, Music and Design, Department of Design
Supervisors: Mette L´orange and Timothy Parry-Williams
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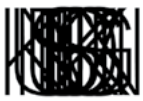

University of Bergen
Faculty of Fine Art,
Music and Design

Preface

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Affiliation

This PhD project in artistic research, *Odd New Spring: Towards Evolving Landscapes and a Reorientation in Design Practice*, has been conducted at the Department of Design, Faculty of Fine Arts, Music and Design (KMD), University of Bergen between October 2018 – June 2024. It has been supervised by Mette L´orange, artist, architect and former Professor of Colour at KMD and KHiO, and Tim Parry-Williams, Professor of Textiles at the Art Department of KMD. The artistic results will be publicly showcased through the solo exhibition *Odd New Spring* at the University Museum in Bergen, the Natural History Collections, ´Tårnsalen´ [the Tower Hall] in June 2024.

Research Motivation

I want to start with a short journey back to my childhood playground in my grandmother's garden, on an island south of Bergen. There was an area of tall and dense growing plants, that we used to call "the bamboo jungle". This was a place of adventures, where we played hide and seek or crafted swords, flutes, and sticks from the fast-growing plants. Years later, I recognised this early botanical acquaintance in the newspaper, under the headline: "Do you have this in your garden? It must go!"[1]. For the first time in my life, I learned that the "bamboo jungle" consisted of the plant called Japanese knotweed (*Fallopia japonica*) and for the first time, I also realised that not all nature is welcome or wanted. Some plants are, in fact, even fought by the government. These plants are termed Invasive Alien Plant Species (IAPS)[2]. While the term "weed" can encompass any plant growing in an undesirable location, IAPS specifically refers to non-native plants, that proliferate and adversely affect their new environments, causing economic, social or ecological harm[3]. In Norway, a species is considered an IAPS if it has propagated outside its natural range by means of human activity and has settled in Norwegian nature after 1800.

After reading the article, I searched for plans and pictures in old family archives and found that the garden surrounding the house built by my great-grandparents had been planned by a landscape architect. At this time, in the 1920s, the island was windswept and the climate rough. Any plant that would provide shelter from the wind was an appreciated feature. The idea to use Knotweed probably originated from the landscape architect, who was hired to plan a large fruit and berry garden with beds of flowering perennials and herbs. The goal was to create a garden that was both useful and beautiful, providing shelter from the wind and adding a variety of colours to the landscape. The specifics of the original garden plan, including which ornamental plants were part of it and which were added later, remain uncertain. Today, the garden hosts several plants classified as IAPS in Norway. In addition to the Knotweed, we have Large-leaved Lupine (*Lupinus polyphyllus*), Yellow Loosestrife (*Lysimachia punctata*), Beach Rose (*Rosa rugosa*), Sitka Spruce (*Picea sitchensis*), Goats Beard (*Aruncus dioicus*), Red Elderberry (*Sambucus racemose*), Cotoneaster

(*Cotoneaster bullatus*) and Scotch Broom (*Cytisus scoparius*).

For my grandparents, the garden, that once was a barren and windswept landscape, evolved into a thriving habitat supporting a diverse range of species. To me, the garden has become a place for reflecting upon the changing attitudes towards nature and the environment[4], and a starting point for both artistic and theoretical research into new knowledge and future possibilities for coexistence. When I applied for the PhD Programme in Artistic Research at KMD, I was a self-employed designer[5]. After graduating from the University of the Arts Berlin as an Industrial Designer in 2010, I had engaged in various projects, concepts, and commissions for eight years. During this period, my design practice gradually transitioned from being driven by concepts and experiments into a more commercial direction. Adapting to large corporations and mass production, I felt like a minuscule fragment in an overly vast puzzle. In this system, the quality and sustainability seemed to be overshadowed by transient trends and profit-driven priorities. Moreover, with creativity, development and production being dispersed globally, no entity seemed to be accountable for environmental or human exploitation. From my position as a freelance designer, I found myself unable to have an impact on standards on ethics or sustainability. The system felt excessively abstract, intricate, and disconcerting. This sentiment was intertwined with a growing awareness of the global climatic crisis and challenges related to production and (over-) consumption. I felt an increasing urge to take a step back, aiming to find a way to reorient my professional activity into a position that allowed me, as a designer, to have a greater influence and overview over the processes involved. I wanted to delve deeper into the range of possibilities within the designer's role and the professional environment in which we operate.

The Reflection Component

As stated in the regulations for the degree of Philosophiae Doctor (PhD) in Artistic Research at the University of Bergen, the PhD result consists of two parts: the *artistic result*, describing the performative or creative artistic result, and a *reflection component*, documenting critical reflection.

> This reflection component shall "be documented in the form of submitted material, with a critical approach to:
> (a) process in respect of artistic choices and turning points, the use of theory and methods, dialogue with various networks and professional environments etc.;
> (b) establishment and description of own artistic standpoint and work in relation to the relevant subject area, nationally and internationally; and
> (c) contribution to the professional development in the field, including any professional innovations. The candidate chooses the medium and form for the reflection component and for any other documentation."[6]

This is not an academic thesis, and to emphasize its reflective and personal nature, it is written in the first person. Throughout the artistic project, I've sought to integrate various forms of writing as modes of thinking, reflecting, and arranging. Therefore, presenting the reflection component as a collection of texts can be seen as a continuation of this process. Writing has taken on diverse forms and played different roles in advancing the project at various stages. It has ranged from scribblings on post-it's to diaries and journals, transcriptions and edits of conversations, abstracts, a conference paper, an essay for a book, field notes, reflection notes, emails, and mind-mappings. The texts are structured thematically to invite the reader to engage with and make sense of a long, and not very linear, process. Each text articulates and connects relationships, discussions, findings, proposals, and open endings from the creative process into a transparent structure. As Henk Borgdorff points out in *The Conflict of the Faculties: Perspectives on Artistic Research and Academia*, "… there will always be a gap between what is displayed and what is put into words."[7] Also Erik Vassenden points out challenges regarding the

critical reflection component in artistic research, and the fact that "the practitioners" (the artistic researchers) have a varying degree of "…putting into language, their own practical experience…", and that strikingly many "…fall back on well-known available forms."[8] I can relate to this. As a counterpoint to the artistic result, where the "knowledge production" is implicit in the works, the written word stands as an "explicit" articulation of the project's intentions, relationships and contributions. To make the mentioned gap between the artistic result and the reflective text as small as possible, the text is accompanied by images from the process and the results. With this, I hope the reflection can be perceived as a method of thinking through, documenting, sorting, and elaborating on both the significant as well as the minor elements of the project.

The bare landscape surrounding the house and garden of my grandparents, around 1930.
Photographer unknown.

Me working with Japanese knotweed in my grandparent´s garden, 2019.
Photo: Niklas Sebastian Alveberg

NOTES

1 Schau, M. (3. June 2011). *Do you have this in your garden? It must go!* [Original title in Norwegian: Har du disse i hagen? De må bort! Helt vanlige hageplanter er svartelistet i Norge], NRK; https://www.nrk.no/livsstil/har-du-disse-i-hagen_-de-ma-bort_-1.7659186

2 Terminology: The terms “Invasive Alien Plant Species,” ”Alien,” and ”Native” are employed in this text to align with the terminology and definitions used in national and international regulations on plant species. But I also use my own words to describe these plants as “the new flora”, “new local plants”, or just “the plants”.

3 Orion, T. (2015). *Beyond the war on invasive species. A permaculture Approach to Ecosystem Restoration*, Chelsea Green Publishing

4 This text is an extract from my own essay *Fieldnotes from the forbidden Garden*, published in the book BioColours, by Aalto University Press, 2023

5 Wilhelmsen, S. E. (n.d.). *About*. Siren Elise Wilhelmsen Studio. Retrieved May 23, 2024, from http://www.sirenelisewilhelmsen.com/about

6 Regulations for the degree of Philosophiae Doctor (PhD) in Artistic Research at the University of Bergen, *Section 10-1. Requirements for the PhD result, https://lovdata.no/dokument/SFE/forskrift/2022-11-24-2595/KAPITTEL_4#KAPITTEL_4, uthentet 02.05.24*

7 Henk Borgdorff comments on the open form and the `appropriate´ documentation format of an “intuitive creative process”.
Borgdorff, H. A. (2012). *The conflict of the faculties: Perspectives on artistic research and academia,* Chapter 7, p.166-168. Leiden University Repository.

8 Vassenden, E. (2013). *What is critical reflection? A question concerning artistic research, genre and the exercise of making narratives about one’s own work*. Norwegian Artistic Research Programme. Retrieved from http://artisticresearch.no/wp-content/uploads/2012/09/What-is-critical-reflection.pdf, p. 31-32

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Finally, I want to direct gratitude and appreciation to the University Museum for hosting my exhibition, *Odd New Spring*, in June 2024.

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Introduction

In this Introduction, I will present the main themes and goals of my artistic research project *Odd New Spring: Towards Evolving Landscapes and a Reorientation in Design Practice*. After providing background information, I will present the research questions and the four sub-studies, before outlining the structure and scope of this written reflection.

Evolving Landscapes

I grew up in Bergen, a relatively small city (globally speaking) on the Norwegian west coast. People have lived in these landscapes, characterised by islands, fjords and mountains, for over 10.000 years – since the last ice age[1]. Over thousands of years, the landscape has changed, as has the flora and fauna. Humans have dwelled in tents and cabins, gathered plants, fished, and hunted. Since people started settling in small houses, working the fields and keeping livestock, more and more areas have been adopted for human purposes. Archaeological finds of axes, daggers, and sickles made of flint, greenstone, rhyolite, and diabase constitute tools likely utilised in early agriculture around 4,300 years ago[2]. This tells us something about how earlier societies have lived with and in these landscapes. The valley bottoms, slopes, and areas along fjords and estuaries are where loose masses historically have attracted most agricultural settlements. The surrounding countryside near Bergen provided the resident population with essential products from the outset. The availability of fish and the town's location in one of the larger and more agriculturally favourable areas in the West were decisive factors for establishing the city in 1070. During the Middle Ages, Bergen emerged as one of Scandinavia's largest and most vital trading hubs[3].

The wealth and prosperity generated by oil drilling have transformed Norway from a relatively poor country[4] to becoming one of the nations with the highest GDP[5]. The emissions from Norwegian consumption range fifty percent higher than those from consumption in Sweden[6]. In 2024, Norway experienced `Earth Overshoot Day´[7] on April 12, marking one of the earliest occurrences globally. This date marks the point at which we, as a nation, have used all of the renewable natural resources the Earth can regenerate in an entire year. The Global Footprint Network's calculations, centred on key drivers like climate emissions and resource consumption from forests and the food system, reveal that our consumption rate implies a demand equivalent to 1.7 Earths. This means natural resources are being depleted seventy percent faster than nature can replenish them.

Traditional practices, such as cultivating the land, raising livestock, crafting, and manufacturing commodities, have almost disappeared from the Bergen valley. Although the topography still features mountains and sea, it is now interspersed with an urban landscape.

Markets and trade in regional goods have been replaced with shops that predominantly sell global products. We have transitioned from being dependent on what nature could provide to becoming detached from the landscape, no longer having to survive only on local produce. Yet, our welfare and high consumption are leading to a depletion of the living world and the non-human species surrounding us[8], and so, it represents a threat to our own existence on planet Earth.

The Norwegian Climate Committee recently presented a report for 2050 stating that all policies must be based on the premise that each resource is scarce[9]. It asserts that solutions to reduce the use of scarce resources such as energy, land, minerals, and metals must be prioritised. To be able to put this into practice, up-to-date knowledge about the state of the land is required. This year, Norway's public broadcaster, NRK, revealed, with the help of artificial intelligence, extensive interventions in Norwegian natural habitats – forty-four thousand interventions in five years. For the first time, the report provided a comprehensive image of how natural habitats are gradually diminishing[10]. It shows how the continuous development of new residential areas, cabin development areas, power stations, infrastructure, and industry is turning green areas grey. These kinds of urban expansions, industrial growth, and intensified agriculture are tangible alterations that are possible to spot with the naked eye. Yet, more subtle changes, such as climate variations, changing ecosystems, and the influx of new species, require different kinds of attention to be spotted. Intensified import and a culture of travelling has contributed to introducing new flora and fauna. Species are being relocated across the globe. Some do not survive in their new habitats, some adapt, and others thrive. This last group is known as Invasive Alien Species[11].

A Local Design Practice

What is this a symptom of? Has the detachment from our local landscapes, in terms of what we make and consume, made us unable to comprehend the implications of our lifestyle? When we don't depend on what this land produces, do we still worship it? Do we still take care of it? My experience is that in our digitalized and globalized everyday lives, we are mentally separated from our living surroundings and the landscapes we inhabit. My design practice has been contextualised within this same culture, and through *Odd New Spring*, I have examined ways of returning to the local.

The French philosopher and sociologist of science, Bruno Latour, introduced the concept of *Gaia 2.0*[12] as an extension of the Gaia hypothesis, which was initially proposed by scientist James Lovelock and biologist Lynn Margulis in the 1970s[13]. The Gaia hypothesis suggests that the Earth functions as a self-regulating system, where living organisms interact with the non-living components of the planet to maintain conditions conducive to life. Latour's idea of Gaia 2.0 builds upon this concept but also incorporates the role of human activity and technology in shaping the Earth's systems. He suggests that humans, through their actions, have become a geological force capable of influencing the planet on a large scale – the post-anthropocentric world.[14] In Gaia 2.0, human activities such as industrialization, urbanization, and climate change are seen as integral parts of the Earth's self-regulating system. He argues that recognizing the agency of humans in shaping the Earth's systems is crucial for addressing environmental challenges and promoting sustainability. By acknowledging our role in Gaia 2.0, we can better understand the complex interactions between human societies and the environment, and work towards more responsible stewardship of the planet. In the book *Down to Earth* Latour writes: "We are discovering, more or less obscurely, that we are all in migration toward territories yet to be rediscovered and reoccupied."[15] And further, he suggests that, "Each of us thus faces the following question: Do you continue to nourish dreams of escaping, or do we start seeking a territory that we and our children can inhabit?".

As a designer, I see my role as deeply inter-connected with the ecological and climatic changes and the understanding that we all have both a responsibility and a possibility to actively contribute to new, sustainable development. For

me, the term Anthropocene underlines Latour's approach to Earth as transformed and damaged and serves as an important reminder of the necessity to nourish and revitalize. When returning to our local landscapes and imagining how we today can live with and of the land we inhabit, open and long-term approaches will be necessary to develop knowledge, skills, and culture to foster, maintain and develop sustainable local livelihoods over time. In this project, I seek strategies for how designers can act as mediators and developers of such positive future scenarios in the evolving landscapes.

Material Culture

While the term *industrial design* is directly linked to industrial production, *material culture* refers to the many aspects of materials, objects and artefacts that are created, used, and valued by our society[16]. Material culture is not only a subject of scholarly investigation but serves as both a framework and a mindset applicable to diverse fields, including archaeology, history, science, social and environmental studies, biology, and philosophy. Anthropologists utilise the analysis of material culture to comprehend human interactions with their surroundings, the expression of identity, and the communication of meaning through tangible objects. It also extends to individuals engaged in world-building and object-shaping activities, such as designers, architects, artists, and craftspeople. Anthropologist Tim Ingold expands the concept of material culture beyond mere objects and manufacturing processes to encompass the beliefs, values, customs, and practices of society, shedding light on our way of life and societal norms[17]. He calls for an ecological approach that encourages active engagement with one's surroundings. I view this perspective as a means of reflecting on and getting involved with the materials and the living world.

In the text *Design (in) Context*, I will delve further into the contextualisation of the project and demonstrate how the Transition Design (TD) framework also situates design practice within a broader context, which prompts reflections on the complex interplay of ecological, social, and cultural factors. This perspective highlights an interdisciplinary context, where the design practice intersects with socioeconomic and sociopolitical processes. To me, this places the role of the designer as an actor in the material culture and a co-creator of norms, customs and value sets. A new material culture entails a change in mindset in the way we use and relate to materials in our society. This may involve the understanding, appreciation and consciousness towards new natural resources as materials for our everyday lives, and a new awareness of the impact that consumer goods and material choices have on the environment and society.

IAPS: A New Flora or Unwanted Nature?

Invasive Alien Plant Species (IAPS)[18] serve as a significant example of how the anthropocentric worldview influences the natural world and our interaction with it. They represent a paradox in our relationship with nature, highlighting both our resistance to change and our role in causing these changes. As described in the preface, my focus on foreign, unwanted plants, or IAPS, is connected to a personal bond to my grandmother's garden and the (invasive) plants growing there. Through this relationship, I became aware of and interested in the discourse surrounding unwelcome nature, which, in this context, is defined as non-native plants introduced by humans or human activities that proliferate and negatively impact their new environments, causing economic, social, or ecological harm[19].

Today's methods for managing IAPS present both ecological and economic challenges[20]. Common measures include regularly cutting and removing plants, excavating and disposing of fertile soil (contaminated with roots) in tunnels or shipping it abroad, covering areas with landscape fabric (mostly made of plastic), and using various weed killers, predominantly Roundup[21].

Through my journey towards a reorientation in design practice, and a "landing" (ref. Bruno Latour) in the local landscape, a group of IAPS will accompany me, as a navigation apparatus. This group consists of the 72 plants placed in the "highest risk category" on the Norwegian "List of Alien and Invasive Species of 2018"[22]. On this journey we are all strangers, seeking new paths for settling and coexisting[23] in

an unfamiliar landscape.

As the PhD project started in 2018, the first sub-study and following exhibition, *Interpreting Fallopia japonica* presented a design perspective on Japanese knotweed, focusing on materials and colours. At the time, little research was found on colours and materials from IAPS. But in the following years an increased focus on the topic has resulted in interesting studies and projects world-wide. To mention some: NYC based artist Ellie Irons has made watercolours from local IAPS through her project *Invasive Pigments*[24], Alyssa Dennis, based in Maryland (US), has started the *Invasive Apothecary*, where she works with IAPS as part of her multidisciplinary art and clinical herbal pharmacy practice[25], UK-based designer Marina Belintanis devoted her MA degree to material research on Japanese knotweed[26], and the city of Ljubljana has made a major investment concerning the handling of IAPS, called the *Applause project*[27]. From the University of Ljubljana, two papers concerning colour extracts from Japanese knotweed have been published: *Screen printing with Natural Dye Extract from Japanese Knotweed Rhizome*[28] and Cationic Pretreatment of Cotton and Dyeing with Fallopia Japonica Leaves[29]. The book, *True Colors: World Masters of Natural Dyes and Pigments*[30], presents the story of Avani, a non-profit organization in India. Their mission is to bring back community-driven, local textile production and responsibly made goods. Research on regional dyestuff revealed that a local pest plant, *Ageratina adenophora,* could yield a range of yellow and green dyes. Through regular harvesting, thereby removing the plant from the woods, the community helps balance the local ecosystem, which was suffering by the invasion of this plant. At the same time, the community accesses a wild growing dyestuff which is plentiful.

These examples are intriguing indicators of a new tendency, and a shifting mindset towards sustainable economic and social systems, based on holistic handling of IAPS as natural resources. While I share overlapping goals with these projects, I also differentiate myself from them. Firstly, my work is situated in a different landscape and bioregion, as there have been no projects concerning the mapping of IAPS as materials in Norway. Secondly, my approach is broader in scope. Whereas these projects focus on specific topics, *Odd New Spring* is characterized by a holistic perspective, aiming to map and gather knowledge about a large group of plants and a wide range of applications and approaches. Thirdly, through this research project, I have had the opportunity to embrace the experimental, open, and inquisitive aspects of the project, as it is not driven by commercial needs. Here, I see my role as a designer as one who can weave together the threads and form a cohesive whole.

Research Questions

Odd New Spring: Towards Evolving Landscapes and a Reorientation in Design Practice is an attempt to investigate methods and strategies for place-based design practice and investigate the designer's role as a mediator and developer of positive future scenarios and nature-based local material culture. To me, the new flora, also defined as Invasive Alien Plant Species (IAPS), represents the evolving landscapes and a new starting point for local activity. Through an open and inquisitive approach, I aim to challenge the prevailing perception of these plants as harmful species and juxtapose our relationship with them against sustainability, production, consumption, and the management of natural resources. The plants carry stories from different places and eras, which in the artistic work weave together past and future, creating a canvas for reflecting on connections and relationships in the present. The project invites a new kind of interaction with the plants and landscapes. I view the project and my role as a designer as bridging the gaps between time, space, and professional disciplines and aiming to contribute to the design field with methods and strategies from an experimental and open exchange with an interdisciplinary area of knowledge. The main intentions are captured in the following research questions:

• Material Culture: *How can I develop methods and strategies for integrating Invasive Alien Plant Species (IAPS) into sustainable local material culture, drawing from historical and contemporary practices, and how can this approach add value to my role as a designer?*

• Local Landscape/IAPS: *How can the coexistence and utilisation of IAPS transform the perception of these plants from harmful invaders to valuable resources and "new flora", fostering ecological and cultural sustainability?*
• Designer's Role: *How can the design practice serve as mediator and developer of positive future scenarios promoting local livelihood, culture and communities?*

Sub- Studies Introduction
The project relates to a complex and multifaceted context, which will be elaborated on in the text *Design (in) Context*. This broad perspective is a method of mapping aspects, narratives, interests, new connections and potential future roads. This theoretical approach is also a concept for approaching a systemic and transitional strategy. Yet, in order to zoom in, experiment hands-on, come in contact with people and communities and be able to take various perspectives from within the project, four sub-studies have been developed. They present an opportunity to go deeper into aspects I have defined as key areas. Within these defined areas, I have explored various aspects, methods, and practical investigations, and developed artistic results. These studies highlight different parts of the same map, together creating a cohesive whole. Each sub-study consists of a theoretical and formal exploration, field- and studio work, experiments, activities for sharing and presentation, as well as co-learning or collaboration.

The sub-studies each contain a conversation with representatives from different fields. These conversations signal the value and importance the interdisciplinary discourse has had in the artistic research project and is a tribute to collective learning and thinking. Through the conversations, we share and discuss our overlapping, intersecting and expanding interests, concerns, and visions. In the texts, *Nomen Est Omen, Interpreting Fallopia Japonica, Colours of the Forbidden Garden* and *Fibrous Futures*, the sub-studies, their respective topics and processes, will be elaborated on.

Here is an overview:

Nomen Est Omen – creating a new narrative
Focus on the big landscape, the multitude of stories and the mapping of stories and historical, (geo-) political and cultural positions. A starting point for reflecting on and reimagining narratives for the IAPS in the local landscape.

Interpreting Fallopia Japonica – portraying individuality (and belonging)
Focus on one plant, the individual story, strengths and weaknesses. What can we detect when zooming in from the macro to the micro scale? A special focus on IAPS for food security, and alternative ways of cultivating and harvesting is highlighted by one of the plant's cultural purposes, as an edible plant.

Colours of the Forbidden Garden – presenting diversity
Focus on colour as a material for design and local material culture. This study focuses on natural resources and explores the processes of "colour making", through outlining the diverse colour palette presented by the IAPS.

Fibrous Futures – thinking long-term for new material cultures
Focus on the IAPS as possible sources for local fibre-related crafts and techniques. The various types of fibre and their possibilities as materials for design is placed in context with systemic transition for long-term development of new material cultures.

Content of the Reflection Component
This reflection component consists of six parts, aiming to provide deeper insight into the context, theories and methodology, sub-studies, process, artistic choices and activities. It also includes a presentation of the artistic results, the final exhibition and a conclusion on the project and its contributions.

In the text *Design (in) Context*, I offer a contextualizing of my pre-PhD practice and position the research project within the (expanded) field of design. I illustrate how

situating my discourse within a complex context has become the foundation for developing a new methodology and discuss the theories and insights that have shaped the development of the project's conceptual framework and methods. I outline the methods I have used or developed throughout the project, and examine how working in this way has impacted and influenced the project.

Nomen Est Omen, is an excavation into historical and current layers of human-plant relationships. The conversation with plant ecologist, and professor at UiB, Vigdis Vandvik[31], contributes to a concentrated insight into the discourse concerning Invasive Alien Plants Species, and reflection on this specific plant-human relation. Further, it documents and presents the artistic process surrounding the mapping and collecting of knowledge and stories for the conceptual development of presenting the new narratives.

Interpreting Fallopia Japonica, is a study of Japanese knotweed, or the plant called "the monster weed". Although on the list *100 of the world's worst invasive alien species*[32], this plant has a long tradition as a food and medicine plant in parts of Asia. In a conversation with permaculturist and forest gardener Benedicte Brun from Matskogen på Landås [Landås Food Forest][33], we discuss alternative ways of cultivating and harvesting food in Norway and reflect upon possible futures of coexisting with the knotweed. The artistic work in this sub-study includes material experimenting, cooking and collective learning – origin and history, material possibilities, and outlook into a new belonging.

Colours of the Forbidden Garden, presents a series of material experiments conducted to discover and showcase the diverse colour palettes represented by these plants. It also presents a conversation with artist and conservator Bent Erik Myrvoll[34], who works with natural mineral pigments. We discuss the power of local pigments and concerns when working with natural resources. It also presents related activities, and two papers about the results of the colour study.

Fibrous Futures, is dedicated to fibre-based crafts, to explore and understand the various types of fibres from the IAPS, and their possibilities as materials for design. This is a broad collection of techniques and stories, and a consideration of long-term potentials and cultural value of the raw material. In a conversation with one of the few remaining ropemakers in the World, Sarah Sjøgreen[35] at The Hardanger Maritime Centre in Norheimsund, we discuss the value, history and prospective trajectories of traditional material-based craftsmanship.

New Ground, provides an overview of the results as presented at the final exhibition, titled *Odd New Spring,* at the University Museum in Bergen, The Natural History Collections' Tårnsalen [The Tower Hall]. *New Ground* is the overarching term that describes the artistic results, and is understood as both a destination and a starting point. As a conclusion of the project, a reflection is given on how the project contributes to the design field, and other fields, as well as an outlook on the future impact the *New Ground* might have on discourses regarding local material cultures, coexistence with IAPS, and design practise(s).

In addition to these six parts, two further texts are provided as appendixes. These are:

Appendix A) *Plants out of place? A design-driven investigation of colour and material possibilities within a group of "invasive alien plant species" in a Norwegian context*; a conference paper for the International Colour conference in Florence, published in *Colour and Colorimetry. Multidisciplinary Contributions*, 2022.

Appendix B) *Fieldnotes from the "Forbidden Garden"*; an essay written for the book *BioColours*, published by Aalto University Press, 2023.

NOTES

1 Overall summary, based on general knowledge, as well as information obtained from: Grepstad, O., Helle, K., Lillehammer, A., & Tryti, A. E. (2006). *Vestlandets historie. Bd. 1: Natur og næring.* Vigmostad & Bjørke., p.28-75

2 Byantikvaren i Bergen kommune (2021), *Kulturmiljøplan for Bergen. Del 2 og 3. Kulturmiljøplan plan for Bergen 2021- 2025, Identitet med særpreg,* p.51-52. Hentet fra: https://www.bergen.kommune.no/api/rest/filer/V447093

3 (Byantikvaren i Bergen kommune, 2021)

4 That Norway at the end of the 19th century was one of Europe's poorest countries has been repeated time and time again. In 1889, Christian Krogh painted the picture "The Struggle for Life". The following year, Knut Hamsun wrote the novel "Hunger". Both writers and painters have depicted life in the cities at this time. Also in the 1960s when Norway started oil exploration, the economy was below the average in Europe.
Sandvik, P. T. (2020) *«Hvordan kom Norge ut av fattigdommen?»*, Norgeshistorie, Universitetet i Oslo: https://www.norgeshistorie.no/industrialisering-og-demokrati/1561_hvordan-kom-norge-ut-av-fattigdommen-.html
In her book about Norwegian cooking habits, Annechen Bahr Bugge, makes several remaks on "hunger as a Norwegian food tradition". p. 20,24,88,93, 279,286, 392, 428, 496, 507
Bugge, A. B. (2019). *Fattigmenn, tilslørte bondepiker og rike riddere. Mat og spisevaner i Norge fra 1500-tallet til vår tid.* [Food and Eating Habits in Norway from the 1500s to the Present Day] Cappelen Damm Akademisk.

5 The UN association keeps track of GDP per capita, to measure the level of prosperity in a country. The latest measurement is from 2022, and ranks Norway in second place worldwide: https://fn.no/Statistikk/bnp-per-innbygger

6 Olav A. Øvrebø (2024) *Utslippsfordelingen [The distribution of emissions], Klimavakten*, Energi og Klima: https://www.energiogklima.no/klimavakten/utslipp-per-innbygger

7 WWF Verdens Naturfond. (n.d.). *Norges overforbruksdag*. Retrieved from https://www.wwf.no/klima-og-energi/norges-overforbruksdag

8 UNEP. (2021). *Making Peace with Nature: A scientific blueprint to tackle the climate, biodiversity and pollution emergencies*. (978-92-807-3837-7). Nairobi: United Nations Environment Programme Retrieved from https://www.unep.org/resources/making-peace-nature

9 Klima- og miljødepartementet. (2023). *Omstilling til lavutslipp, Veivalg for klimapolitikken mot 2050*. Regjeringen.no. Retrieved from https://files.nettsteder.regjeringen.no/wpuploads01/sites/479/2023/10/Klimautvalget-2050.pdf

10 Støstad, M. N., Mon, S. T., & Solvang, R. (2024, January 6). *Norge i rødt, hvitt og grått*. NRK. https://www.nrk.no/dokumentar/xl/nrk-avslorer_-44.000-inngrep-i-norsk-natur-pa-fem-ar-1.16573560

11 Artsdatabanken is the Norwegian Biodiversity Information Centre. They are tasked with conducting risk assessments for species and ecosystems, offering digital tools and services for biodiversity knowledge, and disseminating new insights on species and ecosystems in Norway. Their list of alien and invasive species is found here: https://www.artsdatabanken.no/fremmedearter.

12 The concept of Gaia 2.0 has been discussed by Latour in various works and presentations over time. "Facing Gaia" is a significant work in discussing Gaia 2.0, "Down to Earth" provides further elaboration on the concept and its implications.
Latour, B. (2017). *Facing Gaia: Eight Lectures on the New Climatic Regime*. Polity Press.
Latour, B. (2018). *Down to Earth: Politics in the New Climatic Regime*. Polity Press.

13 While Lynn Margulis collaborated with James Lovelock on the development of the Gaia hypothesis and provided important insights, it was primarily James Lovelock's book "Gaia: A New Look at Life on Earth," published in 1979, that popularized the concept and brought it to broader public attention.
Lovelock, J. E. (1979). *Gaia: A New Look at Life on Earth*. Oxford University Press.

14 "Critics say it is a missed chance to recognise that the planet irrevocably left its natural state in the mid-20th century".

Carrington, D. (2024, March 22). *Geologists reject declaration of Anthropocene epoch*. The Guardian. https://www.theguardian.com/science/2024/mar/22/geologists-reject-declaration-of-anthropocene-epoch
In her newest book, Anna Tsing introduces a relevant take on the Anthropocene as a "patchy" occurrence. From this point of view, local and regional social and ecological interventions can act as acupunctural approaches towards healing the planetary crisis.
Tsing, A. L., Deger, J., Saxena, A. K., & Zhou, F. (2024). *Field Guide to the Patchy Anthropocene.* Stanford University Press.

15 Latour, B. (2018)

16 Tharp, B., & Tharp, S. (2018). *Discursive design: Critical, speculative, and alternative things.* p.8, MIT Press.

17 Ingold, T. (2000). *The perception of the environment: Essays on livelihood, dwelling and skill*. Routledge.

18 Terminology: The terms “Invasive Alien Plant Species,” ”Alien,” and ”Native” are employed in this text to align with the terminology and definitions used in national and international regulations on plant species. But I also use my own words to describe these plants, such as “the new flora”, “robust local plants”, or just “the plants”.

19 Orion, T. (2015). *Beyond the war on invasive species. A permaculture Approach to Ecosystem Restoration*, Chelsea Green Publishing

20 In Norway, several authorities collaborate to combat (harmful) invasive species. On The Norwegian Environment Agency’s [In Norwegian: Miljødirektoratet] pages, there is both an “Cross-sectoral national strategy and measures against harmful invasive species” and an “Action plan against harmful invasive species” for insight in strategies and measures:
Miljødirektoratet. (n.d.).*Invasive Species* [Norwegian Title: Fremmede arter]. Retrieved from https://www.miljodirektoratet.no/ansvarsomrader/arter-naturtyper/fremmede-arter/

21 Anne-Kari Holm, *Biology and control of the invasive Fallopia taxa*, Norwegian University of Life Sciences Faculty of Veterinary Medicine and Biosciences, Department of Plant Sciences, S.13, 2014

22 Artsdatabanken’s (Norwegian Biodiversity Information Centre) *List of Alien and Invasive Species* was relaunched in 2023. The group associated with *Odd New Spring* belongs to the highest risk category from 2018, when the project started. The relaunched list can be found here: https://www.artsdatabanken.no/fremmedearter.

23 *Coexistence* denotes the peaceful and cooperative living together despite differences. It involves individuals, groups, or entities harmoniously interacting despite diverse backgrounds or beliefs. Key aspects include fostering tolerance, understanding, and respect for differences, as well as peaceful interaction and finding common ground for mutual benefit amidst disagreements.

24 Beans, C. (2018). *Painting with invasive pigments.* Proceedings of the National Academy of Sciences, 115(4), 627-629. https://doi.org/10.1073/ pnas.1721721115

25 Dennis, A. (2022). *Invasive Apothecary Retrieved* 2024/05/01 from https://ecliptaherbal.com/invasive-apothecary

26 RCA. (2020). *Marina Belintani*. Royal College of Art. Retrieved 2024/05/06 from https://2020.rca.ac.uk/students/marina-belintani

27 UIA. (2022). *About APPLAUSE*. The Urban Lab of Europe. Retrieved 2023/13/04 from https://www.uiainitiative.eu/en/operational-challenges/ljubljana-applause#main

28 Klancnik, M. (2021). *Screen Printing with Natural Dye Extract from Japanese Knotweed Rhizome.* Fibers and Polymers, 22(9/2021). https://doi.org/DOI10.1007/s12221-021-0955-4

29 Gorjanc, M., Kert, M., Mujadžic, A., Simoncic, B., Tavcer, P., Tomsic, B. & Kostajnšek, K. (2019). *Cationic Pretreatment of Cotton and Dyeing with Fallopia Japonica Leaves. Tekstilec, 62, 181-186. https://doi.org/10.14502/Tekstilec2019.62.181-186*

30 Recker, K. (2020). *True colors, world masters of natural dyes and pigments*. Thrums books.

31 University of Bergen. (n.d.). Vigdis Vandvik. Retrieved May 23, 2024, from https://www.uib.no/personer/Vigdis.Vandvik

32 Here Japanese knotweed is listed under the name Polygonum cuspidatum, synonyms Fallopia japonica and Reynoutria japonica. IUCN Species Survival Commission, Invasive Species Specialist Group. (n.d.). *100 of the world’s worst invasive alien species.* Retrieved from https://www.iucngisd.org/gisd/100_worst.php

33 Matskogen Landås. (n.d.). *The Food Forest Landås* [In Norwegian: Matskogen Landås]. Retrieved May 23, 2024, from https://www.matskogenlandas.no

34 Myrvoll, B. (n.d.). *Bent-Erik Myrvoll*. Retrieved May 21, 2024, from http://www.bentmyrvoll.com

35 Sarah Sjøgreen is one of the world’s only remaining full-time rope-makers who masters the art of hand-twisting ropes, as it has been practiced since the Middle Ages. She works at The Hardanger Maritime Centre in Norheimsund: www.fartoyvern.no

Design (in) Context

Design in Context has been the title of a series of weekly lectures on design theory for students at KMD. For this chapter, I slightly adjusted the title to capture the essence of situating both the practice and the research project, distinguishing between *design in context* and *design context*. *Design in context* refers to the environment, subjects, and conditions related to the design's outcome, encompassing cultural, social, economic, and environmental factors. In contrast, *design context* describes the environment or situation where design occurs or is discussed. This includes the factors that shape the design practice, discourse, and outcomes, such as historical, cultural, technological, theoretical, and methodological aspects.

To be situated in a new context does not necessarily affect the design context. Yet, in this project, the new surroundings require a new set of tools and methods to be resolved. As the title reveals, the project aims at a *reorientation in design practice*, and the first step towards this change is the new context(s). To unfold these new relations and positions, I will look at the artistic process in relation to: (a) the design field. By sharing insights into how my pre-PhD practice has been involved with traditional industrial- and discursive approaches, I clarify the shift to a new design position and in what way this approach includes the (b) larger multidisciplinary environment surrounding social, economic and natural systems intertwined in the discourse of coexisting with Invasive Alien Plant Species (IAPS). Finally, I look at (c) the artistic research environment and how this context has influenced both process and outcome.

In this chapter, I present the use of methods and theories, clarifying how methodological pluralism[1] is held together by a framework based on the three theories of complexity and relations: *Rhizomatic Thinking, Actor-Network Theory,* and *Transition Design*.

Design Background

My passion for design has always been driven by curiosity and the joy of envisioning and creating the not-yet-existing. To create objects that interact with other people's lives and everyday surroundings, their ways of living, thinking, or acting, is inspiring to me. During my studies at the University of the Arts Berlin (2004-10), I began exploring the ontology of things we take for granted in our everyday lives. Through my design projects, I delved into various dimensions of the fundamental essence of our everyday objects, concepts, and phenomena. My goal was to uncover the unfamiliar within the familiar or use the ordinary to generate novelty, sparking wonder, reflection, and curiosity. Inspired by designed objects for reflection, I looked to designers and movements where design was a means for asking questions.

Practitioners, such as Dunne & Raby, several *droog* designers, along with self-proclaimed ex-de-

signer Marti Guixe, represented, for me, both a playful and a critical design approach[2]. The latter few engaged in commercial product design with a playful twist or provoking thought. Dunne & Raby, on the other hand, delved deeper into the critique, developing theories and projects that encouraged profound questioning. They viewed design objects not merely as items of desire but as mediums for discourse[3]. In their 2013 book *Speculative Everything*, they introduce their work as a speculative design approach that thrives on imagination, aiming to offer fresh perspectives on complex issues and foster discussions about alternative future scenarios.

New terminology and design positions grew out of the critical and speculative design environment surrounding Dunne & Raby at the Design Interactions department of the Royal College of Art (RCA) in London. Their work has influenced discourse and practice in design, particularly in areas related to questioning established norms and exploring alternative futures. Also, designer and theorist from the University of the Arts London, Central Saint Martin's, Matt Malpass, has comprehensively categorized and reflected upon the critical design approach and the broader scope of alternative design approaches, gathered under the still expanding *Extended Field of Design*[4]. In his book *Critical Design in Context: History, Theory, and Practice* he elaborates on the terms, similarities, and distinctions between design as a critical, social or sustainable practice, and he dives into a broad spectre of terms and directions, like conceptual design, speculative design, design fiction, design activism, critical design, design as politics, social design, participatory design, open design, meta design, transition design, transformation design, co-design, post-industrial design, and sustainable design[5]. The book is a helpful overview for navigating design practices that operate outside the global economy and mass production. Also, US designers and scholars Stephanie and Bruce Tharp, have contributed to a deeper understanding of the Extended field of Design with their principle of a *Four Fields of Design Framework*[6] and the book *Discursive Design: Critical, Speculative, and Alternative Things,*[7] which highlights alternative approaches to design. Their approach will be further discussed in the section *A Reorientation*.

Credit and attention should also be given to the early critical voices from within the design field, such as designer and professor Victor Papanek. He started his book *Design for the Real World* (1971) with the sentence: "There are professions more harmful than industrial design, but only a few of them."[8] He identified the design industry as a key factor in the harmful and destructive development caused by global production and consumption already then. Papanek called for designers to embrace a broader understanding of their role and to use their skills to create positive social change and promote sustainability, equity, and justice in the world. His contributions have become important for generations of designers, to critically reflect on principles to tackle contemporary challenges and to understand the transformative potential design holds. His work has contributed to the development of the Extended Field of Design and several design approaches described by Matt Malpass, Stephanie and Bruce Tharp. His social and system -critical approach is also reflected in Transition Design principles, which has had an impact on my artistic research project.

Around the same time, in the late 1960s and early 1970s, the movement Radical Design emerged in Italy. It was characterized by experimentation and socio-political activism. The movement sought to challenge established conventions and norms within design and architecture, advocating for radical social and cultural change through new future visions and (utopian) scenarios. Among the various collectives, groups, and practitioners associated with the Radical Design movement, designer Enzo Mari has notably influenced my perspective on design, particularly through his 1974 book *Autoprogettazion*[9]. This book, or manual, presents a collection of simple furniture designs that can be easily constructed from timber or scrap materials. It intended to empower individuals to become creators of their own furniture. Despite the affordability of these designs, the idea was that the objects would increase in emotional value due to the owner's involvement in the making process. This involvement also facilitated the acquisition of knowledge and skills. This anti-capitalist approach,

resembling an early analogue version of *open source*, envisioned design liberated from centralized control over production. In one of his last interviews, Mari said:

> "The first problem facing a designer is to define his own model of an ideal world, and not to create an aesthetic… The designer cannot fail to have his own ideology of the world. If he has none, he is a fool who only gives shape to other people's ideas." [10]

I interpret this statement as recognizing the designer's responsibility (and ability) to influence and propose change at different levels. *Autoprogettazione* became a lifelong project for Mari[11], and his radical approach to design has stayed with me as a positive example of bringing design to the marked (the people), yet outside of the globalised industry.

My design education and early practice were influenced by this conceptual, critical and speculative approach to design. This came to show in my diploma project, *Everything counts* (2010). Here, I investigated the perception of time and natural processes, which resulted in the *365 Knitting Clock*. The clock was not meant for telling time, but to reflect on our relationship to it. It knits a mesh every hour and makes one round every day. After a year, it has knitted a two-meter-long scarf. It was inspired by the nature of time as an ever-ongoing process defined by change. Also, the thermochromic textile *Season Carpet* was inspired by nature. Its colours changed and adapted to the seasons and aimed to bring focus on the natural time-based colour-variations. Reminding us of our connection to the living world. Yet another project was *You+Me Dynamo Lamp*, a lamp driven by self-generated electricity, attempting to encourage and seek solutions for off-grid living.

Returning to Norway in 2013 after a decade in Berlin, marked a significant change in my practice. Previously centred on creating objects for wonder and reflection, I found myself compelled, both by necessity and opportunity, to collaborate more closely with the industry. These experiences provided insights into various aspects of global production and marketing systems. I observed first-hand the constraints designers face when it comes to influencing quality and standards in production processes, when collaborating with global brands. These experiences exposed a system that wasn´t in line with my reasons for bringing ideas or objects into the world. A high turnover of models and designs, long distances between production and sales markets, difficulty in gaining insight into, or influencing, working conditions, environmental impact and resource usage, were some of the main factors that sparked the search for new ways of thinking and doing design.

A Reorientation

As mentioned above, the artistic research project has provided an opportunity to reorient both within the design context and the context in which the design process is situated. The project has been situated in the landscapes of Bergen and the surrounding bioregion[12], where I live and work. Here I have a direct access to plants, processes, collaborators, stakeholders, and community. The IAPS that grow here serve as a foundation for both material and discourse.

To place my research project, *Odd New Spring*, within the design field, the following sections are dedicating to describing how the project aligns with frameworks and values conducive to utilising design as a tool for recognising and proposing transition and change. Based on three relevant design frameworks, I will show how *Odd New Spring* is positioned between, and overlaps with, relevant discourses. The three frameworks are: *The Four Fields of Design Framework, The Human x Nature Manifesto*, and *The Transition Design Framework*. I will compare the aims and objectives of the project within each framework.

Four Fields of Design Framework:

In their 2018 publication *Discursive Design: Critical Speculative, and Alternative Things*, US design scholars Bruce and Stephanie Tharp delivered a thorough review of discursive designs roles, limitations and potential[13]. The book highlights the diverse ways in which design can be approached and expanded on in the Extended Field of Design. In an interview with Core 77, Bruce and Stephanie

Tharp state that, "Without a compelling, indeed, taxonomic, way of organizing design activity, we are selling ourselves short; we not only have difficulty understanding the profession ourselves, but also in communicating to the world our potency, range, and potential impact."[14] There has been this recurring idea, both within and beyond the realm of design, suggesting that when designers move away from industrial production and commercial markets, they venture into "design centred around ideas".[15] I understand it as: making design for the gallery space. This, in many ways, is in line with my early practice of creating "objects for reflection." The Four Fields of Design Framework is a way of acknowledging the varied intentions of design and recognising them as design. The categories commercial design, responsible design, experimental design, and discursive design is a superordinate differentiation of design intentions. To place the present PhD project within the four fields has been a first attempt to identify its position in the Extended Field of Design. By going through the framework, I will show how the project associates to the four categories.

• Commercial Design:
The most common and well-understood field of product design. It primarily focuses on creating products with the goal of generating profit – emphasizing functionality, aesthetics, and marketability.
> *Odd New Spring* aims to map and develop local possibilities for new material cultures. While the research may spark future economic innovations, its primary goal isn't profit driven.

• Responsible Design:
Characterized by its intention to "serve the unserved" and address social issues, this category focuses on helping aids and social justice.
> *Odd New Spring* intends to serve the local community by establishing a social platform for the project in the long term. Minimizing environmental impact and prioritizing long-term sustainability could be understood as community driven actions, yet the project is somewhat outside of the scope of this category.

• Experimental Design:
A primary intent is to explore possibilities, without a commercial goal or commitment. It often overlaps with art and science and can lead to new discoveries and techniques that may eventually be adopted in more practical applications.
> *Odd New Spring* involves exploring new materials, technologies, and processes without the immediate concern for marketability or practicality. The goal is reconnection, innovation and pushing the boundaries of what is possible through local design-driven processes.

• Discursive Design*:*
Aims to provoke thought, discussion and reflection on social, cultural, or political issues. It uses design as a medium to convey messages and challenge perceptions.
> *Odd New Spring* aims to challenge norms, question societal values, and explore speculative and alternative futures through the presentation of experimental material strategies and the creation of new narratives.

I guess most projects will align with more than one of these fields, but it´s useful to assess the weighting of the different elements. Instead of being rigid categories, the four fields may be understood as focus areas or elements in a project. In *Odd New Spring*, the "score" is medium to high in two areas, indicating a discursive approach with a main focus on the experimental material approach. I miss a clearer inclusion of sustainability and ethics in the Four Fields of Design Framework. The authors have stated that sustainability should be included in all categories and is, therefore not a field of its own[16]. I find that this represents a shortcoming in the framework, as it disables the differentiation between a general and a specific approach to the topic.

The Human x Nature Manifesto
A framework that devotes its focus completely to this topic, is the Human x Nature Manifesto. To define and discuss the material exploration aspect, it is necessary to highlight its close relationship with plants and introduce a framework that considers other-than-human species. Neri Oxman and the MIT Media Lab have a long history of approaching biology as a part of their practice. Oxman describes her own area of study as *Material Ecology*. Here the material is leading the design process: "The field operates at the intersection of Biology, Material Science & Engineering and Computer Science with emphasis on environmentally informed digital design and fabrication. Products and buildings are biologically informed and digitally engineered by, with and for, Nature."[17] The research focuses on chemical components, like chitin from shrimps, silk from worms, active protein and pigment from living organisms. Through this co-creation and technology, alternative materials and future scenarios are developed. As an educator and researcher, Oxman has published several papers

and works. Most relevant for the PhD project, is the manifest and film *Nature x Humanity* from 2020, made together with the MIT Media Lab[18]. Here they call for a shift from Human-centric to Nature-centric design. In a Nature-centric view every design construct is a whole system, that symbolizes an important shift from "consuming Nature as a geological resource to nurturing it as a biological one."[18]. The manifesto consists of nine commandments in three main categories, which I have used as a reference for my discussions on ethical issues and the values embedded in the research project.

• Nurturing (NU):
Emphasizes a shift in mindset towards considering nature as an integral stakeholder in design processes, alongside traditional human clients. It advocates for design solutions that not only serve human needs but also contribute to the well-being and preservation of natural ecosystems. It promotes activism within the design community to influence corporations towards adopting nature-centric values and practices across various industries.
> *Odd New Spring* has studied a nature that is not welcome, which, through new narratives and a shift in mindset, could be integrated into new local actions. Through systems of care and repair, it could become valuable both to society and local ecosystems. Careful handling is necessary to avoid exacerbating the situation.

• Naturing (NA):
Focuses on design practices that prioritize organic growth and development over standardized assembly processes. It encourages designers to view their creations as interconnected systems within broader natural, biological, and digital contexts, rather than as isolated objects. It suggests leveraging technology to innovate architectural practices, focusing on sustainability and adapting to changing environmental conditions.
> *Odd New Spring* shows examples of how the IAPS, if implemented in our consumption, could reduce the amount of certain imported goods. Many of these plants are robust to drought and flood, which make them reliable in a future scenario and the likely event of changing environmental conditions.

• NU/NA:
Highlights a preference for diversity and customization over uniformity and mass production in design. It underscores the importance of considering the ecological implications of design decisions, particularly in terms of resource consumption and ecosystem health. It advocates for designing with the natural lifecycle of materials in mind, ensuring that they can be reintegrated into ecosystems to support ongoing regeneration and sustainability.
> In *Odd New Spring* the life cycle is important in a long-term perspective towards local systems of making. Most of the IAPS are perennial plants, which means that if they are taken care of in the right way, they will return year after year without seeding, ploughing or extensive use of fertilizers.

Oxman advocates for a design approach that finds inspiration in the natural world to tackle contemporary challenges. Her belief in biomimicry, which involves emulating nature's strategies and solutions in design, highlights the vast reservoir of knowledge and inspiration that nature represents. Although, it seems, that the relation to Nature is limited to the laboratory, the approach acknowledges nature's potential to inform the development of environmentally friendly and harmonious designs.

My approach is less focused on technology and more on developing local, sustainable livelihoods, made possible within the surrounding nature. Nevertheless, the manifesto serves as a noble reference in design values and collaborations across human and more-than-human relations. It emphasizes a radical shift in mindset rather than merely critiquing the current development, it stands as a hopeful vision for a design-driven restoration and revitalisation of the natural world. While the Four Fields of Design Framework did not specify the ecological aspects, the *Nature-centric* design approach highlights these.

Transition Design
Exploring new materials, technologies, and processes that minimize environmental impact, promote social equity, and prioritize long-term sustainability, will most often require engagement or collaboration with other fields. Initially, system-level change was not among the goals of *Odd New Spring*. Though, as the process unfolded, it became evident that a shift of mindset and an alternative approach to IAPS, calls for a system change. In contrast to the two previous frameworks, The Transition Design Framework places design in the middle of the complex, interconnected structural challenges confronting the world today[19]. It highlights the significance of making comprehensive systems, behaviours, and cultures instead of exclusively concentrating on singular products.

Through Terry Irwin's article *The Emerging Transition Design Approach*[20], key aspects of the

Transition Design Framework are outlined. These include building on and understanding complexity, adopting a holistic approach, maintaining a long-term vision, promoting participatory engagement, facilitating cultural transformation, fostering interdisciplinary collaboration, and emphasizing ethics and values. These aspects are organized within a framework consisting of four main areas. I will discuss and compare them individually:

• Vision for Transitions:
This involves creating a clear and inspirational vision of the future, including the desired outcomes, values, and principles that guide the design practice. It reflects goals such as sustainability, equity, and resilience, serving as a guiding beacon that inspires action and shapes the direction of subsequent design initiatives.
> A vision for *Odd New Spring* is to contribute to the development of new material cultures, based on coexistence and sustainable utilisation of the local landscapes and resources, represented by a group of IAPS.

• Theories of Change:
This encompasses the fundamental assumptions, beliefs, and hypotheses about how societal transformation happens and how design interventions can aid this process. *Theories of Change* are grounded in an understanding of complex systems and social change dynamics, outlining the causal pathways through which interventions lead to the desired outcomes.
> Through the process, *Odd New Spring* has sought to explore the potential for systemic change and identify theories for behaviour change, political reforms, technological innovations, and ecosystem restoration.

• Posture & Mindset:
This refers to the attitudes, values, and approaches essential for a transition design practice, including openness, curiosity, empathy, humility, and reflexivity. Embracing design challenges with humility, recognizing the limits of one's own knowledge and expertise, and being open to diverse perspectives and feedback will promote a mindset of collaboration, learning, and empathy among stakeholders.
> *Odd New Spring* acknowledges the situation's complexity and emphasizes the need for collective action towards a societal and political *shift in mindset*.

• New Ways of Designing:
This aims to innovate and evolve design methodologies, processes, and practices to tackle complex societal and environmental challenges. Methodologies that enable transformative change are adapted to the design practice to embrace complexity, uncertainty, and emergent outcomes.
> *Odd New Spring* seeks to develop a methodology based on systems thinking, speculative and experimental nature-centric design approaches.

The Transition Design Framework is grounded in a long-term vision and acknowledges the necessity for solutions rooted in new, more sustainable, and politically conscious paradigms[21]. To me, this defines a new approach to engage with everyday life through design. While my practice has focused on objects, Transition Design emphasizes local visions of sustainable lifestyles. In alignment with this, the artistic research project has been concerned with experimental material interaction, speculative visions of systemic change, and local long-term strategies for new material cultures. Such a strategy is designed in the text *Fibrous Futures*. Focusing on Transition Design, and its foundation from *The Theory of Living Systems*, fundamentally challenges existing paradigms and aims to inspire and inform change through the design process. The complex context genuinely assigns the practice a new position and defines its roles based on a new set of rules. The Transition Design Framework demonstrates how the shift in (my) practice, is a reorientation towards actions of speculating, and developing visions and strategies for local, sustainable lifestyles, through interdisciplinary collaborations in the scope of socio-economic, political paradigm and material culture.

Through comparing and connecting the artistic project to the three different design frameworks, I have tried to establish an understanding of the *design context*. Here, we see how the reorientation in the design practice aligns with Experimental, Nature-centric and Transition Design approaches. I remain committed to the fundamental necessity of a critical design practice, which involves reflecting through and on design, as well as considering the impacts of design education and the adverse effects the globalised system has on culture and the environment. However, rather than merely pointing out and critiquing the issues, *Odd New Spring* aim to demonstrate and exemplify change through its practical approach, which has materialized in the artistic results (see text *New Ground*).

A (second) Note on Material Culture
While the Transition Design Framework does not mention material culture specifically, there is a strong bond between socio-economic, political paradigms and material culture, which is of high

relevance in my artistic research project. Socio-economic and political paradigms determine the distribution of resources, power dynamics, and societal values, all of which impact the production, consumption, and meaning attributed to material culture. For example, in growth-driven, capitalist societies, consumerism and mass production are often dominant, leading to a particular type of material culture focused on market-driven products and disposability. In contrast, in societies with different socio-economic or political paradigms, such as socialist or indigenous communities, material culture may prioritize sustainability, communal ownership, and cultural preservation. Through the project, understanding the socio-economic and political context has become essential for comprehending the nature, evolution, and significance of the material culture within our society.

The Artistic Research Context: A Pathway to Interdisciplinarity and Methodology

My project was one out of four design projects in the first national group of PhD fellows in the Norwegian Artistic Research Programme (NARP). Although the platform was new, it had already gained a solid foundation and recognition through its predecessor; The Norwegian Artistic Research Fellowship Programme (2003-2018)[22]. The third cycle is not an intuitive continuation of the formal design education, hence the mandatory seminars and forums by NARP [23] have been useful introductions into some of the fundamental dimensions of artistic research; like subject, method, context, and outcome, as well as topics like documentation, ethics and use of theory. An early conceptualization of the term *Artistic Research* has been presented as a consensus of its definition[24]. It was introduced in a paper by Christopher Frayling, the director of the Royal College of Art at the time, in 1993. Here, he presented the distinction between 'research *into* art'– referring to art history or theoretical research, 'research *for* art' – meaning applied research aimed at providing insight and tools for practical artistic use, and 'research *through* art' where artistic practice itself is integral to both the research process and outcomes, reflecting a deep integration of theory and practice [25].

As a third cycle in art education, research *through* art is a sensible approach. It emphasizes that artists are not merely creators of art but also active participants in the research process. This model integrates artistic creation and scholarly inquiry, where the artist's unique experiences, reflections, and practices contribute directly to research outcomes. Here, artistic practice itself is considered a form of research, and the knowledge generated through it is valuable and insightful. However, finding the form of doing research *through* art is not easy, and it challenges both traditional scholarly inquiry and the conventional approach to art. For me, artistic research, with its reflective focus and approach, has been a pathway to methodological awareness. It has also placed my practice in an interdisciplinary realm through the fellowship and the institution itself—KMD as part of the University of Bergen. This large research community has become increasingly important throughout the project and has provided an ideal setting for exploring design practice in relation to society. The more I have developed my understanding and position as an artistic researcher, the more comfortable I have felt engaging in interdisciplinary exchange. The University represents a vast amount of history, theories, and knowledge—continuous dialogues, corrections and unfinished thinking. Engaging, commenting, challenging, and contributing to this, I see my subjects and methods becoming integrated into a broader collective process of exploration, creation, and reimagining.

The development of a contextual and methodological framework has clarified, unwrapped, and expanded the project's scope in ways that would not have been possible without the time and input from this specific context. Within artistic research, combining artistic approaches with research methodologies has created an interdisciplinary practice that emphasises exploration, experimentation, and the generation of new insights through design. These insights aim to contribute to artistic research in design, Transition Design, and the discourse on strategies for fostering local sustainable material cultures. I aim to contribute to these areas with novel perspectives on approaches for coexisting with Invasive Alien Plant Species (IAPS).

Complexity and Relations: A Methodological Framework

Given the complexity of the design context in which the Transition Design Framework operates, it functions not just to define a situation, but to establish a methodology. By including methods for recognising relationships, understanding contexts, and identifying potential strategies for intervention, it offers theoretical guidelines towards transition and systemic change. However, Transition Design is not the only approach that supports systems thinking, and in this research project, two further theories have been influential. Rhizomatic Thinking[26] and Actor-Network-Theory[27] have had an impact on the development of the methodological framework, which has been supported and extended by the Transition Design principles. In this section, I elaborate on the use and development of the theoretical and methodological framework.

Rhizomes and Networks

A method that runs like a common thread through the project is mapping – from simple structures to complex plans. In the beginning, I mapped topics and goals in the project, to get a deeper overview, and discover new connections. Yet, what I also discovered was the pattern of the maps themselves: they looked a lot like the rhizomes of the Japanese knotweed, that I knew so well (ref. *Interpreting Fallopia japonica*): entities – connections – pathways – clusters. Unlike a tree, a rhizome has no centre, from where everything grows. It is seen as a continuous network, without a beginning or an end. Rhizomatic Thinking is a model of thought and organization that contrasts with traditional hierarchical structures and is more like structures found in nature – like the rhizome. The concept was introduced in the book *A Thousand Plateaus* by Gilles Deleuze and Félix Guattari, where six key principles were defined:[26]

• Non-Hierarchical Connectivity:
A rhizome connects any point to any other point without following a strict hierarchy. This stands in contrast to tree-like, hierarchical models which follow linear and predictable paths.

• Heterogeneity:
The elements of a rhizome are diverse and varied, with no single element having a privileged position. The connections between elements are multiple and non-uniform.

• Multiplicity:
A rhizome doesn't have a singular origin or central point. It is a multiplicity that can be entered from multiple points and has no fixed, predetermined structure.

• Asignifying Rupture:
If a rhizome is broken or disrupted at any point, it can start up again on one of its old lines, or on new lines. This resilience makes the rhizome structure adaptable and flexible.

• Cartography and Decalcomania:
Rhizomes follow principles of mapping and tracing. It is flexible and attachable to constant modification. Tracing, on the other hand, is like copying an already fixed model, which rhizomes avoid.

• Interconnectedness:
Everything in a rhizome is interconnected. This means that any element of a rhizome can affect and be affected by others, creating a dynamic and constantly changing network.

These principles do not serve as a set of rules for the project, but as propositions and inspirations for its approach. I see the rhizome as a method to break open logics, hierarchies and priorities that dominate design practice, philosophy and academic analysis and as a possibility to map out new fields of relations. In this project, the rhizome as a metaphor mirrors both the concrete biology of the plants, as well as our relationships, multiple connections and junctions with them as concrete and abstract (mental, instrumental) subjects. The theory offers a means to decentralize knowledge and its various dichotomies by adopting a less structured and more open understanding of things and subjects as a multiplicity of evolving shapes[28].

The introduction to Rhizomatic Thinking marked a turning point in the project: shifting from the idea of the project as a linear body of work, where I should narrow down and focus more and more, to the notion of the project as an organically growing entity that would gain nourishment through new connections and interconnections. It should develop through complexity, rather than through simplicity. I envisioned the rhizome, developed by plants as a survival mechanism, with gently extending feelers in various directions to explore where it encounters resistance or nourishment – and that the project could do the same. Thinking of the project in this way allowed several pieces to fall into place, including the idea of sub-studies, co-learning, promoting interdisciplinary dialogue and exchange. By placing

the rhizome in the centre of the methodological framework for the project, the plants became both the objective and the structure – the conceptual and the non-conceptual fundaments – of the project.

The thinking of French sociologist and philosopher Bruno Latour has also informed the project in different ways. His Actor-Network Theory[29] is a method to deploy how heterogeneous elements, including humans, objects, organizations, and concepts, form networks and influence one another within social and technological systems[30]. The theoretical framework examines scientific and technological practices. Both Actor-Network Theory and Rhizomatic Thinking highlight the non-linear, dynamic, and distributed characteristic, suggesting that understanding social and technical phenomena requires a flexible and open-ended approach rather than rigid categories. Bruno Latour described Actor-Network Theory as a way of paying attention to actors (both human and non-human), tracing their actions, and exploring the conditions that make a situation or constellation possible, rather than focusing solely on overcoming or solving problems[31]. The focus on the acting agents, makes this method particularly relevant for my research project. Latour includes both human and non-human entities in the ability to act and influence the network and shaping our world. This focus has been useful when approaching the group of unwanted plants. Through mapping them as acting agents, their agencies can be isolated from societal assumptions, and expressed in a new position. Actor-Network Theory suggests to dismantle the dualities and provide a more nuanced perspective on the dynamics of complex systems and networks.

Rhizomatic Thinking and Actor-Network Theory offer methods to trace a situation, spotting new patterns or relations, new roles or agencies. They have been supportive theories for reflecting on the existing situation, how we relate, and where we might re-connect or re-arrange. Also, the Transition Design principles focus on understanding the complexity of the current and potential future, yet has a more practical and articulated attention on stimulating change. The three methods for system thinking, Rhizomatic Thinking, Actor-Network Theory, and Transition Design, have formed a comprehensive methodological framework for my artistic research project, providing a platform on which to develop a project based on methodological pluralism. This is a pragmatic and inclusive approach to provide a more comprehensive understanding of complex issues. I have approached multiple methods, theories, and perspectives to investigate the different layers of discussions and topics related to the IAPS as both historical, and, potentially, culturally significant plants in the future. This has encouraged integrating approaches and perspectives from different disciplines and a holistic understanding through capturing the multifaceted nature and the interactions between its components.

Methods included in the Process

<u>Acquiring Data and Knowledge</u>

- Literature Review: Reading books, academic papers, articles, and other relevant literature, I have tried to understand the current state of knowledge on the involved topics.
- Data Collection: Formal knowledge, stories and data have been collected to form the foundation of developing new narratives.
- Document and Share: Recording the findings and sharing them with relevant stakeholders or the broader community. Reading relevant literature, collecting data, attending courses in practical plant-based techniques, conducting field studies, talking to experts, observing the landscape, and engaging in cultural and historical research and interviews.
- Semi-structured interviews: Gathering in-depth information through direct interaction with individuals. Throughout the artistic project period, I have been exposed to, inspired and informed by, struggled with, and tried to understand the fields of others. Through articles, books, courses, and documentaries, I have seen how important those different perspectives and disciplines are when it comes to making good and informed choices for (my) design. As examples of those valuable voices, I have invited four representatives from different fields to conversations with me, a plant ecologist, a permaculturist and food forest maker, a fresco artist and a ropemaker. These are people

who, with their perspectives and knowledge, in one way or another, have informed, inspired, or affected the project. It has therefore been a great privilege to be able to discuss some of the core matters in the project directly with them.

Mapping and Analysing

- Mind Maps: Detecting, adding and connecting the project, or elements within the project, to topics, actors, fields, ethical issues and power structures. Gaining an overview of complex relationships and processes, discovering new connections, associations and links, and enabling additions and expansions over time.
- Data-visualisation: In order to present a representative amount of data from the collected stories, a data graphic has been developed.
- Sub-studies: As a counterpoint to the quantitative studies, like mapping thoughts and collecting data within the metalevel of plant-human relations, the design discourse, geo-political landscape or academic research, the engagement in four topics has been useful to highlight four concrete potential strategies for approaching and discussing the IAPS.
- Long-term plans: To consider long-term plans, it's been important to explore the potential for systemic change and identify theories for behaviour change, political reforms, technological innovations, and ecosystem restoration.

Experimental Material Study

- Hands-On Exploration: The physical interaction with the plants and materials, manipulating them, and observing their behaviours under different conditions has been fundamental for the project. Through testing and learning, to imagining and speculating. The tactile engagement has helped to gain an in-depth understanding of the tested materials' characteristics, and their states through the seasons. This is a process where materials are tested, analysed, and refined repeatedly. It allows for continuous learning and adaptation based on the results of each experiment.
- Potential Innovation and Discovery: By experimenting with unconventional plants as materials, the goal has been to discover the potential for future innovative applications, novel materials, and valuable knowledge for self-production, semi-industrial, or small-scale productions. Or to improve existing ones.
- Sustainability and Ethics: Experimental material studies is a way to consider the sustainability and ethical implications of the materials through different processes and techniques.
- Envisioning and Speculating: By imagining different scenarios and outcomes, the focus has been on placing the new narratives in a local, future potential.

Physical Presence and Social Engagement

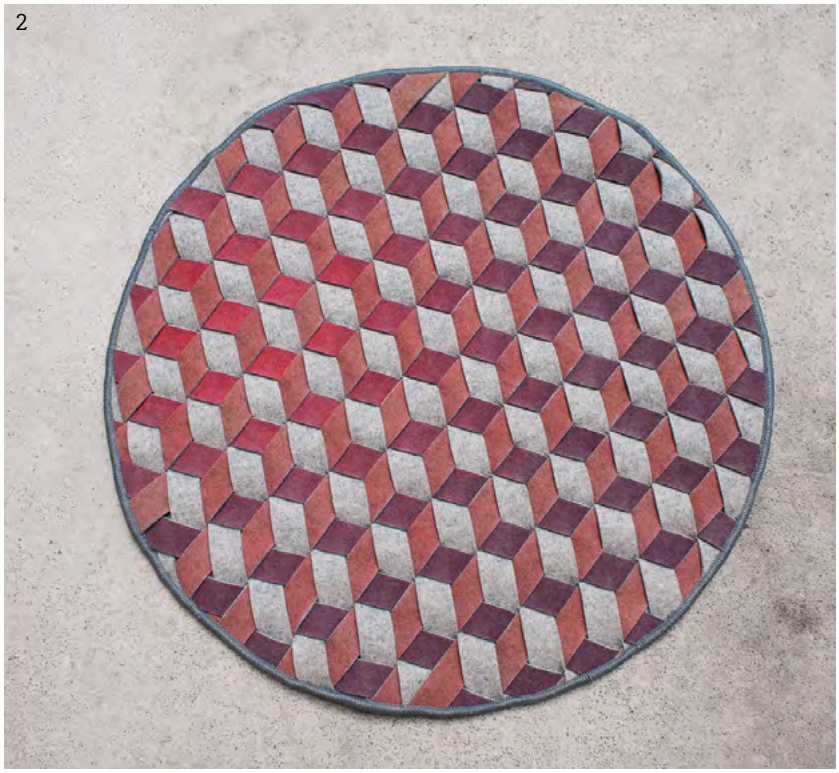
- Fieldwork: Collecting data in a natural setting. The physical presence in the landscape has had various objectives. Reading the landscape, ownerships, habitats, and ecologies. From collecting plants for material-based experiments and investigations to detecting and documenting the landscape and the plants, new understandings and connections have been established. Many of the plants on the list of alien and invasive species in Norway[32] were unfamiliar to me when starting the project, and the fieldwork has been significant in being able to recognise the plants at different stages. With the help of courses, books, the web, and apps, this has been a continuous learning process, with the potential for further skills to be acquired.
- Observation: Recording behaviours or phenomena as they occur naturally involves drawing, being together with, and interacting with the environment—smelling, listening, touching, and studying—which fosters a sense of recognition and admiration. Being with the plants in their own environment, with no further intention than just to be present, has been a method of openly recognising how the landscape, plants, surroundings, as well as human and non-human elements, blend and interact. Initially, I didn't recognise much, but over time, I began to decode growth patterns, locations, and systems. I trained myself to read the layers of plants in the landscape in a new way. It was rewarding to engage in this somewhat unconventional method and to see that the sensitive and quiet approach brought a new openness and perception.
- Fieldtrips: Travelling to Berlin, London, Florence, Lenzing/ Vienna and various places in Norway has connected the project to people and

discourses both nationally and internationally.

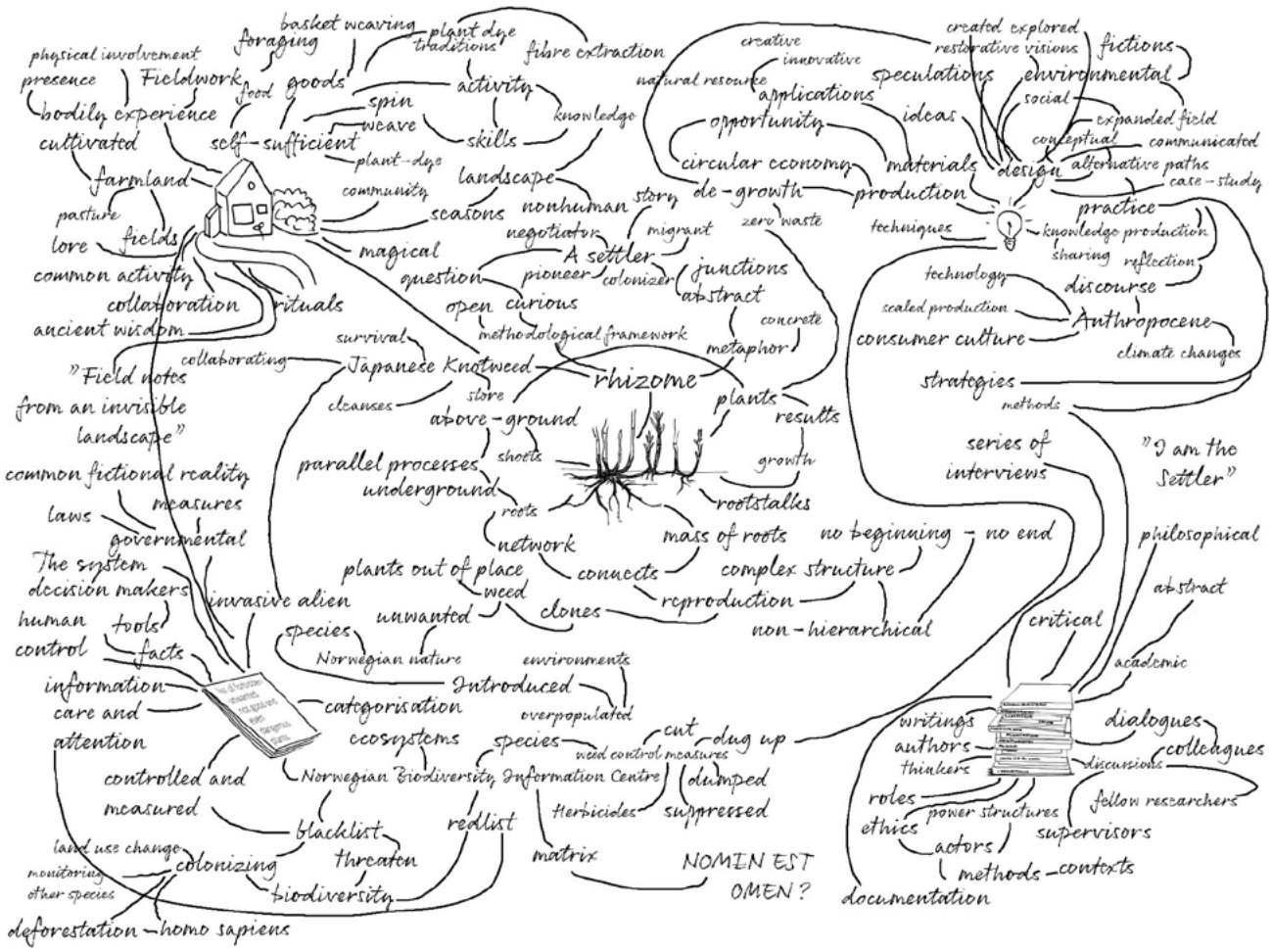
- Co-learning and Collaboration: Although the pandemic made it harder to meet in groups, the project has pre- and post-covid benefited from involving in social engagement, joining in local events, and learning from and together with others. Specific courses, workshops and collaborations are mentioned in the chapters concerning the sub-studies.

Documenting and Sharing

- Exhibitions: Opportunities for dialogue and engagement. I have contributed to exhibitions and events throughout the project to receive feedback and initiate discussions during the process. This has also been a method for highlighting specific topics within the project and engaging with different discourses and contexts. To gain further insights in this field, I attended two of the four modules of the post-graduate course Exhibition Design[33] at the University of Arts Berlin. Unfortunately, the remaining modules were cancelled due to Covid-19. It was interesting and fruitful to discuss formats for unfolding, sharing narratives, and analysing presentations with a varied group of professionals from different related fields.
- Project Presentations and Writing as Scholarly Communication: I have learned a lot from reading scientific articles and theoretical texts. Presenting and writing has been a method to connect with different environments. Both presenting at conferences and writing papers or essays were unfamiliar tools for me as a designer, but these experiences have proved it to be an effective way to facilitate meetings between disciplines. It has helped me to use academic methods to bring artistic insight and the design perspective to new audiences. It has opened new networks of interdisciplinary practitioners and demonstrated the possibility of contributing to other fields and engaging on terms relevant to influence, collaboration and discussion. While this approach may not be a standard goal for all designers or all projects, it has proven to be a useful tool in this project.
- Digital Documentation: The information will be presented on www.oddnewspring.com, which will be a growing platform for unfolding, archiving, and sharing the narratives about the IAPS, as well information about related courses, workshops and other activities. In addition, a presentation of the PhD Project will be available on Research Catalogue.

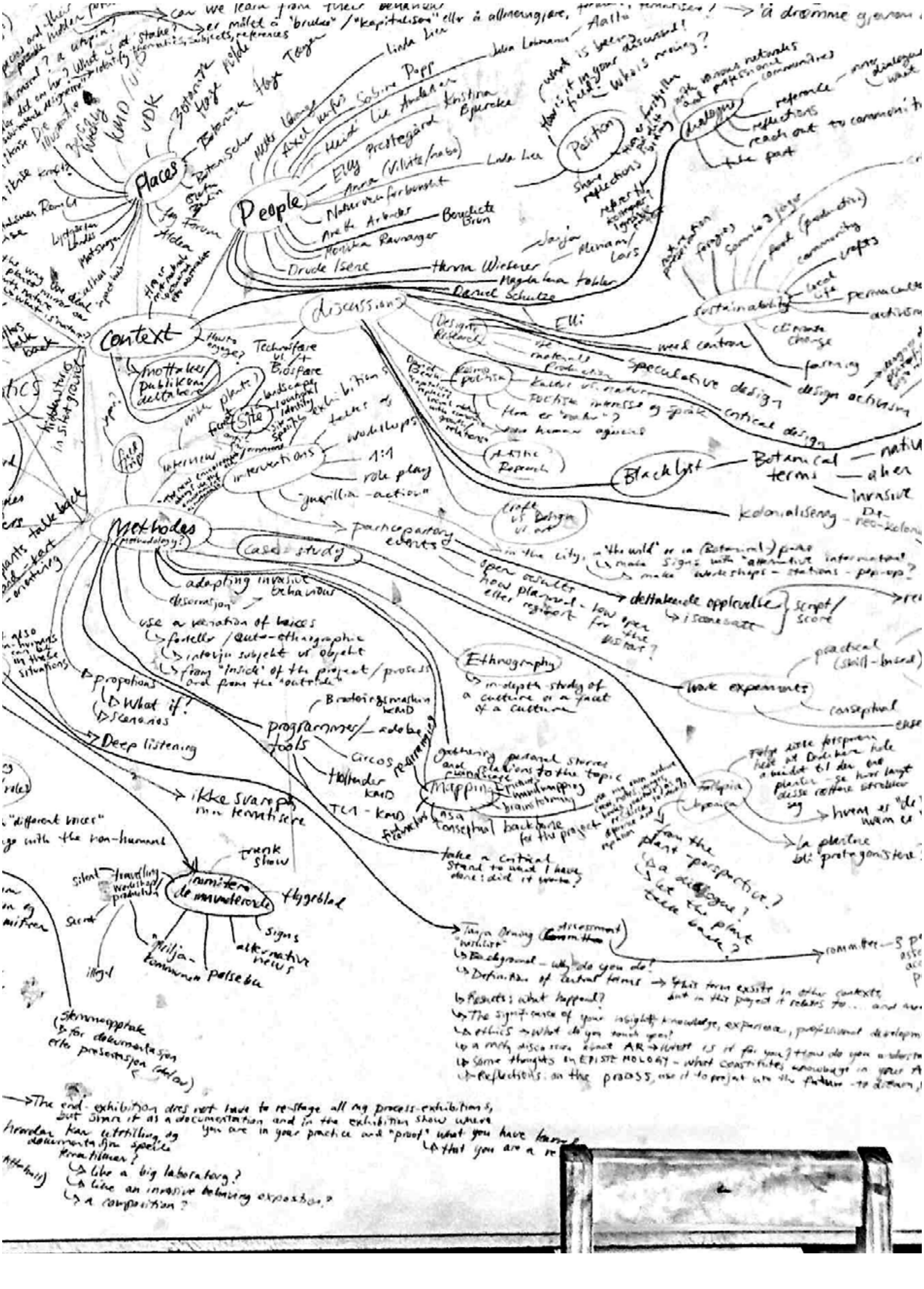


1. *Knitting Clock* (2010)
Photo: Siren Elise Wilhelmsen
2. *Season Carpet* (2012)
Photo: Siren Elise Wilhelmsen
3. *You+Me dynamo lamp* (2012)
Photo: Elisabeth Warkus
4. *Kvelden lamp*, Bolia (2014)
Photo: Marie Jacob



Networks of contexts and relations in the research project, 2021.

Networks of contexts and relations in the research project, 2020.


Places
People
Context
discussions
Position
dialogue
sustainability
Design Research
Speculative design
Critical design
design activism
Blacklist
Botanical terms
Invasive
Methodes
interventions
role play
participatory events
Case study
Ethnography
work experiments
programmes/tools
Mapping
Deep listening
Propositions
What if?
Scenarios
ikke svarepa
Daniel Schutze
Herman Wiesener
Drude Isene
Elly Prestegård
Axel Wolfs
Sabine Popp
Linda Lien
Julia Lohmann
Aalto
Tøyen
reference
reflections
reach out to communities
permaculture
activism
climate change
farming
1:1
"guerilla - action"
adapting invasive behaviour
Ethnography
in-depth study of a culture or a facet of a culture
practical (skill-based)
conceptual
Circos
Hollender
take a critical stand to what I have done: did it work?
Results: what happened?
The end - exhibition does not have to re-stage all my process-exhibitions,
but show it as a documentation and in the exhibition show where you are in your practice and "proof" what you have learned
like a big laboratory?
like an invasive behaving exposition?
a composition?

NOTES

1 “Methodological pluralism, an approach that involves using multiple methods, theories, or perspectives to investigate a phenomenon, is increasingly recognized for its ability to provide a more comprehensive understanding of complex issues.”
Mertens, D. M. (2015). *Research and Evaluation in Education and Psychology: Integrating Diversity with Quantitative, Qualitative, and Mixed Methods*. SAGE Publications.

2 Titles of Works: Dunne & Raby (2007) *Technological Dreams No.1: Robots*. Terjo Remy (1991); *Chest of Drawers*, (1993) Ragchair. Jurgen Bey (1999): *Garden Bench*. Hella Jongerius (2000): *Long Neck Bottle,* Martí Guixé (2004): *Respect Cheap Furniture, Monobloc Plastic Chair*.

3 A. Dunne, F. Raby (2013), *Speculative everything, design, fiction, and social dreaming*, MIT Press

4 The term *Extended Field of Design* was popularized by design theorists and educators Tony Fry and Anthony Dunne through their respective works. Tony Fry (2008) *Design Futuring: Sustainability, Ethics and New Practice, and* Anthony Dunne (1999) *Hertzian Tales: Electronic Products, Aesthetic Experience, and Critical Design*.

5 M. Malpass (2019), *Critical Design in Context. History, Theory, and Practice,* Bloomsbury Visual Arts; London

6 Their *Four Field of Design Framework* was developed ten years before the book was released. First introduced here:
Core Jr (2009), *The 4 Fields of Industrial Design: (No, not furniture, trans, consumer electronics, & toys),* by Bruce M. Tharp and Stephanie M. Tharp, Core77, www.core77.com

7 B. Tharp, S. Tharp (2018), *Discursive Design: Critical Speculative, and Alternative Things*, MIT Press

8 Papanek, V. (1971). *Design for the real world: Human ecology and social change*. Pantheon Books.

9 Mari, E. (1974). *Autoprogettazione*. Corraini Edizioni.

10 Quote from an interview by Artek (2012): *Enzo Mari for Artek - Autoproduzione,* Youtube: https://youtu.be/zdzyiw1Faag?si=LFsAXI_1MQrFGuBA

11 Artist Olafur Eliasson expanded on Maris project, by using the designs as basis for a social initiative for refugees in Berlin: The Cucula Project was motivated to offer “an experimental design space in which social challenges are met with pragmatic and solution-oriented action.”.
CUCULA. (n.d.). *A workshop*. Retrieved from https://www.cucula.org

12 Bioregions are geographical areas defined by ecological characteristics, rather than by human-made borders. It emphasizes the interconnection between environment and human activities, advocating for sustainable living practices that harmonize with the local ecology. The principles were established by environmentalists Peter Berg and Raymond Dasmann in the 1970s as part of the bioregionalism movement.
Cappuccio, S. (2010). Bioregionalism as a new development paradigm. Papers on Territorial Intelligence and Culture of Development . ENTI,Salerno.

13 (Tharp & Tharp, 2018)

14 Core Jr (2009), *The 4 Fields of Industrial Design: (No, not furniture, trans, consumer electronics, & toys),* by Bruce M. Tharp and Stephanie M. Tharp, Core77 / www.core77.com

15 This excerpt references an idea put forth in A. Dunne and F. Raby’s book “Speculative Everything: Design, Fiction, and Social Dreaming” (2013), published by MIT Press.

16 Core Jr (2009)

17 Oxman, N. (2016) *Material Ecology*, https://www.media.mit.edu/publications/material-ecology/

18 Oxman, N. The Mediated Matter Group (2021), *NATURE X HUMANITY*, Milo lab, Weizmann Institute of Science. Originally composed for TWIXT by Francis Ford Coppola. Presented at Dezeen: htt-

ps://www.dezeen.com/2021/11/19/neri-oxman-dezeen-15-manifesto-radical-realignment-grown-built-environments/

19 Irwin, T. (2015). *Transition Design: A Proposal for a New Area of Design Practice, Study, and Research. Design and Culture,* April., 229-246, DOI:10.1080/17547075.2015.1051829

20 Irwin, T. (2018) *The Emerging Transition Design Approach*, DOI:10.21606/dma.2017.210

21 Irwin, T. (2015)

22 Malterud, N. (2012). *Artistic research - necessary and challenging.* Nordic Journal of Art and Research. Originally published in Norwegian in InFormation, 1/2012, and translated into English by Bergen Academy of Art and Design.

23 NARP is integrated into the Norwegian Directorate for Higher Education and Skills, indicating its ongoing function and relevance in promoting artistic research initiatives. The programme organizes various seminars, forums, and workshops to facilitate research and collaboration among artists and researchers. The mandatory courses I have attended in the PhD period are as follows:
Seminar 1 (14-16.11.18): “Theory and Method in Artistic Research”, Voksenåsen, Oslo
Seminar 2 (06-08.02.19): “Documentation and Sharing in Artistic Research”, KMD Bergen
Seminar 3 (06-07.05.19): “Ethics in Artistic Research and Artistic Practice”, Voksenåsen, Oslo
Seminar 4 (04-06.09.19): “Relationships in Artistic Work”, KhiO Oslo
ARF Autumn Forum (17.09.19): Presentation 1, Critical Reflection, Lillehammer
Seminar 5 (08-10.01.20): “Project Development”, Moss
ARF Spring Forum (16-18.03.20): Attendance, Klækken, digital platform
ARF Autumn Forum (12-14.10.20): Attendance, digital platform
Research Catalogue Workshop (15.10.20)
ARF Spring Forum (15-17.03.21): Presentation 2, Methods, digital platform
ARF Autumn Forum (18-20.10.21): Attendance, digital platform
Mid-way Evaluation (07.12.21)
ARF Autumn Forum (24-26.10. 22): Presentation 3, Finishing, Stavanger

24 Malterud, N. (2012)

25 Frayling, C. (1993). *Research in Art and Design.* Royal College of Art Research Papers, 1(1), 1-5.

26 Deleuze, G., & Guattari, F. (1987). *A Thousand Plateaus: Capitalism and Schizophrenia* (B. Massumi, Trans.). University of Minnesota Press. Original work published 1980.

27 Latour, B. (2005). *Reassembling the social: An introduction to actor-network-theory*. Oxford University Press.

28 Vranic, I. (2017). *Materiality and the Rhizome.* University of British Columbia. Retrieved May 23, 2024, from https://www.makinggreenworlds.net/rhizome

29 Actor-Network Theory (ANT) was developed by sociologists Bruno Latour, Michel Callon, and John Law during the late 1980s and early 1990s. Latour continued to develop and expand ANT through his extensive body of work, focused on exploring the role of non-human actors in networks, and the implications for understanding society and technology.

30 Latour, B. (1999). *On recalling ANT.* The Sociological Review Monograph (The Editorial Board of The Sociological Review, Ed.). Retrieved from http://www.bruno-latour.fr/sites/default/files/P-77-RECALLING-ANT-GB.pdf

31 Latour, B. (1999).

32 The list of alien and invasive species in Norway: https://artsdatabanken.no/lister/fremmedartslista/2023?TaxonRank=tvi

33 UdK Berlin. (n.d.). *Zertifikatskurs Ausstellungsdesign.* Berlin Career College. Retrieved May 14, 2024, from https://www.udk-berlin.de/universitaet/berlin-career-college/zertifikatskurs-ausstellungsdesign/

Nomen Est Omen

My PhD project focuses on a group of 72 plants listed by the Norwegian Biodiversity Information Centre (NBIC) as Invasive Alien Plant Species (IAPS). The sub-study *Nomen Est Omen* has aimed to gain a deeper understanding of the conflict that has influenced the debate surrounding the IAPS, with the goal of identifying the topics that have been overlooked in the discussion. In this chapter I dive into historical and current layers of human-plant relationships, before going in depth on the specific IAPS-human relationships together with plant ecologist, and professor at UiB, Vigdis Vandvik[1]. Thereafter, I will give an overview over the artistic process surrounding the development of the *new narratives*.

The Plant-Human Relation

Vegetative life[2] has defined this earth for millions of years, and our complex relationship extends far back into our joint evolutionary history. Philosopher Emanuele Coccia puts this relationship in perspective when he writes, "Plants require nothing but the world's most basic components: rocks, water, air and light and out of these diffuse resources they make, for the rest of the living, a space of habitation: a world."[3]. In other words, our existence depends on their presence. The air that fills us, the nourishment that feeds us, the medicine that heals us, and the materials that build our cities and everyday products are most of all based on plants. Their humble, circular and metamorphic form of life has received adoration and gratitude from earlier societies. Twenty thousand years ago, there were no cultivated plants; hunter-gatherers relied on wild plants, which they knew how to recognise as edible, pharmaceutical or noxious. Both the hunter-gatherer and the subsequent agricultural societies successfully adapted to forests and woodlands[4]. Contemporary projects, like *Vikinghagen* [the Viking Garden][5],[6] and *People and Plants – Rediscovering and safeguarding Nordic ethnobothanical heritage*[7] present documentation on how useful trees, shrubs and herbaceous plants were identified, protected and improved, whilst undesirable species were eliminated.

Plant domestication[8] and agriculture have allowed human societies to develop, and settlements to grow more complex. As such, our modern cities and cultures rely in part on the stable and reliable production and distribution of food[7]. Yet, at the same time, common knowledge about useful plants, the farmlands and the constant and common improvement of our natural surroundings, even of our gardens, has vanished to a great degree.

> "It is, in fact, reasonable to assume that prior to our industrial, mechanised and materialist consumer culture, situations in daily life as well as processes of maturation and education provided a more comprehensive experimental ground for human growth and learning due to their direct interaction with

the natural world and its complex causalities."[9]

British writer Robert Macfarlane has been concerned by these changes – by "children being more at home on the internet than in the woods" – and how this will affect future decision makers and their ability to stand up for a living world they don´t know. Through his project and book *The lost Words*, Macfarlane searches for methods to teach children about endangered species. As he says, "It is not just children who need nature; nature needs children too."[10] Our successful and productive society has removed, not only children but, several generations away from a natural coexistence with the living environment and nonhuman species.

Today, many domesticated species find it challenging to thrive and compete in their natural habitats due to land changes and climate variations. These alterations have disrupted nature's delicate balance, necessitating protection against invasive species and, more significantly, human activity. The growing amount of endangered- and extinct species constitutes one of the great threats for our future existence. This is mostly defined as the threat against natural biodiversity. Biodiversity is vital for the preservation of our biosphere; the performance of ecosystem services, psychological wellbeing, culture and pleasure[11]. Through the age of Anthropocene increased production, deforestation, industrial farming and pollution is disrupting the planet's natural ecosystem[12]. Now we are not only dependent on the plants, but they are dependent on us. The fundamental question remains: are humans truly capable of managing this intricate task?

Conversation with Vigdis Vanvdik

In the following conversation with plant ecologist and professor at the University of Bergen, Vigdis Vandvik[13], we delve into these topics concerning geopolitics and management of IAPS in Norway, as well as possible alternative future scenarios. Vandvik is known for her research in the field of ecology and has contributed significantly to understanding the dynamics of plant communities, climate change impact and biodiversity. Vandvik has published numerous scientific papers and received several awards for her contributions to this field. Her research has contributed to forming the knowledge base on this topic in Norway and abroad.

Siren Elise Wilhelmsen: Maybe you could start by saying something about your various professional roles and areas of expertise?
Vigdis Vandvik: I am a plant ecologist and engage in research and teaching in the field of plant ecology. I work on mountain nature in Norway and how it is influenced by climate change and other global changes. Additionally, I am very interested in the intersection between science and politics, trying on the one hand to involve students in research and understanding, and on the other hand to integrate knowledge into decision-making processes. I have worked in nature conservation in various ways, as a member of the board and an expert for the Norwegian Biodiversity Information Centre (NBIC)[14]. In addition, I am part of the Council on Ethics for the Government Pension Fund Global (GPFG)[15] and have contributed to writing reports for the Intergovernmental Panel on Biodiversity and Ecosystem Services (IPBES)[16], including reports on alien species.

SW: *So, what is the challenge with invasive species, exactly?*
VV: Well, it is a bit odd really, because all invasive species are native somewhere, but the fact that they arrive in a new place makes them somehow troublesome. But it is about the way nature is organized. We have evolutionary and ecological processes that occur over long periods of time, and when we alter the timescale in nature, things get messed up. When species and traits that don't naturally encounter each other suddenly end up in the same place at the same time, it can go wrong. With global warming happening as fast as it is now, nature can't handle it.

SW: *Why is it that alien species are often more successful where they are foreign than where they are native?*
VV: There are various reasons. It could be due to a lack of predators or better growth conditions. But the most vulnerable are islands, where we

normally don´t see as much biodiversity. Here, alien species can take over completely. Like when cats, rats, or minks end up on islands where birds are not accustomed to predators and therefore nest on the ground. The mink is very good at swimming and can easily reach the islands. There, it has no competitors and can feed undisturbed.

SW: *Initially, you mentioned climate change and other global shifts. And if we zoom out, alien species are part of a larger discussion, which revolves around land use changes.*
VV: Yes, and that's simply because 90% of threatened species are threatened by land use changes. It's kind of the big thing that intersects with everything else, isn´t it? When we impact the land, alien species also find it easier to enter.

SW: *In Norway, it's the NBIC, together with experts in the field, that compile the Norwegian "List of Alien Species"*[17]*. This list indicates the ecological risk alien species may pose to biodiversity. You have been heavily involved in this work. Can you say a bit about the assessments? How does an alien species end up on the list?*
VV: This work is very systematic. It revolves around dispersion and impact. The dispersion axis measures how quickly and massively species spread in Norwegian nature, and for how long they´re likely to stay. If it is probable that a species will grow here for more than 350 years and spreads at a certain rate, then it ranks high on the dispersion axis. However, this only applies to species in the wild – those found in our gardens, for example, are not considered alien until they spread into nature on their own. A plant that spreads beyond the fence needs careful monitoring. The moment it reproduces outside, it is established. Then the clock starts ticking, and we begin mapping. The impact is calculated based on various criteria, such as its influence on native species or native habitat types. It can have an impact by genetically mixing with native species and creating hybrids, or by spreading diseases. If it also affects endangered species or habitats, its impact will rank higher. These values will then place the plant into one of the categories[18]. It is a fairly simple principle and a tidy assessment system. Through the NBIC, researchers present the knowledge, but don´t provide any advice on what should be done. So it´s actually a political question how to deal with it.

SW: *Do these guidelines also apply to IPBES? Here, you collaborated with researchers from over a hundred different countries to write about alien species. What kind of insight were you aiming to provide?*
VV: IPBES has a slightly different approach. However, it also aims to provide knowledge to support policy: "Policy relevant", but not "policy prescriptive". The work and knowledge production are to support the Convention on Biological Diversity in the same way that the Climate Panel compiles knowledge to support the Climate Convention[19]. These conventions are intergovernmental diplomatic agreements. In the work on the report, we adhere to the knowledge orders from the parties, which are outlined in what is called the "scoping document".

So, in the report, we compiled all available knowledge about alien species, how they spread, what causes it, what the consequences are, and what kind of policies and management work. Overall, we found, for example, that the harmful effects of alien species cost about a quarter of the Government Pension Fund Global annually. There are negative impacts on fisheries, food production, and on material things that cost us money. And we spend some money on controlling them as well, but not enough. Many new species can be introduced in addition to those we already have, if we don't limit it. Furthermore, we in the IPBES state that the most effective way to stop them is through stronger border and trade controls. Some countries, like New Zealand, which is an island nation and therefore especially vulnerable, have already implemented very strict import rules for living plants, animals, and soil. Additionally, all shoes are cleaned at the airport. Ballast water has also been an international problem, but simple regulations on where and when the water is exchanged has lead to significant improvements. So, it's an example of policies that have worked.

SW: *It would be interesting to hear more about*

the process of working for the IPBES and the international discourse regarding alien species. What has been challenging about collaborating across countries and knowledge systems?
VV: As mentioned, we operate based on orders from the participating countries. They also nominate experts and assemble the panels. Approximately one hundred researchers worked together as lead authors for each report over a period of about three years. The research and perspectives are meant to represent countries from all continents, different genders, and knowledge systems. They should be truly global.

When countries incorporate knowledge from the IPBES into their own policies and guidelines, this results in various focuses and versions, but the point is that all countries should start from the same knowledge base. There are open consultation rounds where everyone can provide input. This reveals some interesting dynamics. For example, there are some countries that don't want to be mentioned in connection with alien species or other environmental issues, while others are proud to be mentioned and gladly suggest their own examples. There was a group of third world countries that criticized the report on alien species, arguing that it didn't include representative data from their knowledge systems[20]. They felt more exposed to the problem than what was portrayed in the report.

We researchers wanted to systematically use knowledge from all countries as well as from local communities and indigenous knowledge throughout the report, but it's clear: we rely on information from public reporting and various types of publications, as well as the input received through meetings and open consultations. Among those who criticized the report afterward, not all had provided input when they had the opportunity. We had 15 languages represented in our group, which is quite a lot. And we had experts from all continents.

Especially for some tropical countries, alien species are a huge problem that affects livelihoods and food production. And these are poor countries. They have little ability to address it. Of course, they want representation in the reports, we understand that, but the information also needs to be accessible for us to use.

Another thing that sparked a lot of discussion was the definition of alien species and how it should look. What was important for the countries was that the definition had to align with their legal systems. When we researchers talked about "biological invasions," that wasn't captured by legal systems. But there are laws that regulate "invasive alien species." So, even though the researchers were more concerned with the underlying biological processes that manifest in materialized change, the terminology and definitions had to be based on the species.

SW: *Does that mean you reached a consensus on a common definition in the report?*
VV: Yes, we did agree on common definitions of alien species and invasive alien species for the report, not necessarily for all countries' policies. But since there is now a shared framework of definitions in the report, we hope that this version will circulate[21].

SW: *I understand that achieving a common definition is challenging. There are indeed various interpretations out there. Some countries include a specific year, while others do not. Why is there such a difference?*
VV: So, the definition of invasive alien species doesn't include any specific year. It indicates that these are species spread by humans to areas outside their natural range, where they reproduce and have a negative impact on the environment. Therefore, the years are pragmatic and used by management or in research to delineate. It is important to look at what knowledge we have. The reason we use the year 1800 as a starting point in Norway is because we have so little data from the collection of plants and animals before that. But some countries use 1500, right? They count before and after Europeans arrived in America. While others use 1700 or 1750. So, there's some variation. And which plants end up on the list depends on the data – it's entirely pragmatic.

SW: But if we stick with the year 1800 for a moment and envision the city of Bergen as it was back then, and compare it to what it´s like today, we see that now we have a completely different starting point, dominated not by plants but by human settlement.

Do we reach a point where the changes in land use and the conditions are so drastically altered that vulnerable species won't survive – neither with nor without alien species?
VV: There are almost always some plants and animals that can survive even in the most human-influenced environments. But the rule of thumb is that the more influenced, the fewer species. And often, alien species can more easily cope in heavily transformed environments. The species capable of spreading often share certain characteristics. They are often a bit weedy. In the report, we had an introductory chapter, a chapter on trends, one on causes, one on effects, one on management, and one on policy. I was involved in writing about causes. Here, we compiled all available information on all possible reasons why species are transported, establish, spread, and cause an effect. Thus, on the spread trajectory. We looked at direct effects, such as climate change, land use, pollution, other alien species, and harvesting of natural resources, and on the underlying societal drivers. World trade is a very important cause of alien species being transported from one area to another. And once they arrive, land use is hugely important for their further spread. Additionally, pollution, and the fact that alien species are already growing there, can make the environment more receptive. Other disturbances and changes will also make it easier for alien species to establish. Underlying factors could be emergencies, such as war or humanitarian crises, which lead to large transports of material and people, coinciding with a breakdown in the regulatory system.

SW: These are very exciting, and frightening, dynamics. And on a small scale, it's probably the same principles at play with the cabin development areas or wind turbines, right?
VV: Yes, exactly. Because roads become very effective dispersal corridors, allowing alien species to establish and spread to new areas, eventually infiltrating natural habitats as well.

SW: So, relatively small nature interventions can escalate?
VV: Yes, it quickly becomes a much bigger problem. Additionally, contaminated soil masses are often used, and then root fragments that easily spread or seeds that live a long time in the seed bank can also be part of the package.

SW: One thing is to limit further spread and introduction of new species. But how do you envision the future with the plants that are already established here, and which the NBIC estimates will continue to grow here for at least another 600 years? In 2019, the Norwegian Environment Agency commissioned Menon Economics and the Norwegian Institute for Nature Research (NINA) to calculate the cost of completely eradicating Japanese knotweed, giant hogweed, and hybrid knotweed[22]. They estimated that it would likely cost around 320 billion Norwegian kroner. So, I wonder, how likely is such a scenario? How many of these "cleansing processes" can we afford? And, is it worth it?
VV: We have also addressed this in the global report, and the cheapest and most effective approach is to prevent it from happening. There is much to gain from tightening import controls; it will limit future invasions. Once things have entered, depending on what it is, where it is, and how harmful it is, there are methods available. We can control and limit further spread. And now there are also modern methods, such as molecular methods, and one of the most debated is "gene drives." This means that you go in and alter the genetic material of the species, so that it can no longer reproduce, for example. Then you let these genes spread in the alien species, and it will eradicate itself. A bit science fiction-ish. But it is indeed possible.

SW: It poses quite a few ethical issues, doesn´t it? A few years ago, England initiated a test project. With hopes of controlling the population of Japanese knotweed, they began introducing a Japanese insect, Aphalara Itadori, known to feed on and weaken the plant in Japan[23]. It sounds like quite a drastic measure.
VV: Yes, it raises tremendously significant questions. And we've had some very negative experiences. We've introduced alien species to eradicate other alien species, only to find that the new alien species was a bigger problem than the one we were trying to combat. The stage before

'gene drives', for example, involves spreading diseases or parasites that attack the alien species. Although, the risk is that we introduce the disease into their environment. A commercialized version of this is Nemaslug, which spreads parasites meant for the Spanish slug (*Arion vulgaris*). But the question is does it only target the Spanish slugs or does it also affect other types of slugs. Can the parasites cross over and spread further into other slug populations? We don't know.

Some countries, like Australia and New Zealand, have been practicing control for a long time. They believe that we need biological control and that we can develop safe methods. But then it's like medicine, right? We need excellent testing, and we need to know that it doesn't have any negative effects on other beings. We need to test everything, but once we've done that, we can determine that it's safe. The reason biological control has a bad reputation is that there was some "cowboy behaviour" in the beginning. They rushed things a bit. And some of us researchers from other countries are still a bit sceptical about this development.

SW: But this type of approach probably works better on insects than on plants, right?
VV: With plants, one often needs to work on containment. We were talking about roads, and if we can stop them along the roads, it's a good measure to prevent further spread. If there are species with an exceptionally large negative impact, we may consider eradicating them entirely in closed geographical areas, such as islands. Another thing we found in the report was that of all documented extinctions due to human activity in the world, and there aren't so many, 16% of these were caused by alien species. For 60%, alien species were a contributing factor. And 90% of these examples are from islands.

SW: The outline of another future scenario is evident in a few examples of alien species commercialisations, such as the king crab and the Pacific oyster[24]. Then there's the example of blue honeysuckle (Lonicera caerulea), which, after a legal process in the EU, was approved as a food plant in Norway in 2019[25]. In this case, nothing further happened. And on NBIC's website, there´s no mention of it being a food plant. What do you think would be necessary to change status of an alien species to become a production species?
VV: King crab and snow crab have become popular because they taste good. I think using harvesting as a control method must be very effective. But it's not the Norwegian Biodiversity Information Centre's mission to report on production species or from production areas. It looks at whether the species has spread to Norwegian nature. Does it reproduce outside the fence?

SW: And is the king crab harvested simply as a control measure?
VV: Yes, that's how it is. It was spread from Kamchatka and was introduced in Russia to increase the economic value for the population in Murmansk in the 1960s, along with the Humpback salmon (*Oncorhynchus gorbuscha*). It took a long time before it started to spread, but then it became massive. This is a very common development – a typical example of how alien species don´t bring natural enemies or diseases with them, which allows them to become dominant in their new environments after some time.

SW: It's an incredibly complex network of components and factors that interact and influence each other. Where should one begin to make a positive change? One of the things I'm still curious about regarding the report from the Nature Panel, is about the proposed measures. I read somewhere that these are not only limited to alien species but are generally beneficial for nature. They were described as "win-win"? Could you summarize a bit what these positive measures are all about?
VV: The main goal is to preserve a nature that is robust and resilient to all sorts of changes, and that can continue to provide services and natural goods in the future as well. And what threatens nature is really a cumulative effect of several things, right? It's urbanisation, overharvesting, pollution, and climate change, along with alien species, and they often compound each other. And then it gets worse. But if we take a step back, the causes are related to societal development. For example, unregulated global trade and

free trade, where there are no environmental regulations. And then you get alien species coming in, for example plants with roots, soil masses, etc. And if we regulated it more strictly, one effect would be that local retailers and local plants could have a bigger place in the market. So, it would be positive for the Norwegian green industry, and would result in less pollution and carbon emissions.

SW: So, using local resources more extensively?
VV: Yes, if we utilise native plants, compost, and create soil, we establish a positive circular system, which is beneficial for both ecology and economy. By planting local plants in gardens, we contribute to providing food for local insects and animals, and we can influence perceptions of what is cool to plant. Also, the use of perennials instead of annual plants is good for the climate. This reduces the need for fertilization and plant control. These are types of win-win situations. Preventing introduction and limiting existing ones.

SW: And what about harvesting as a measure to restrict alien species that are already here? I already mentioned Japanese knotweed; it has a tradition as a vegetable in Japan. Yet, if you Google it, you'll easily find good tips on how to combat it, but little on how and when to harvest and prepare it. Many places you´ll also see it listed as toxic.
VV: But, is it? If not, I think is an exciting alternative. Instead of burning it, it would be positive to use it for something. In that way, we create a resource.

SW: It contains oxalic acid, but so do several other vegetables we eat, like rhubarb and spinach. However, in this case, it becomes highly problematized. In Japan, the stems are soaked in water for a few hours or overnight, or they are boiled. This process removes the oxalic acid. And it's not like other food doesn't require processing. We don't eat raw meat or uncooked potatoes either. I find it exciting that these plants can be harvested and be of use. Wild garlic is an example of a native plant that went from being relatively unknown to soon becoming extremely popular. This shows that there is interest and willingness to forage from nature. So, if we became more familiar with different plants that grow near us and are easy to harvest, we could eat crops that would otherwise go to waste.
VV: I agree, and we also have a tradition in Norway of harvesting from nature. We fish and we pick berries and mushrooms.

SW: But we need knowledge that makes us confident enough to know exactly what, when, and how to proceed. It's also a bit stigmatizing that they are considered alien species. There needs to be a lot of good knowledge dissemination for people to believe that they can be eaten. In my project, I've gathered information showing that a whopping 82% of the plants in this group are edible, while 29% have already been established as food plants elsewhere. I've placed these in the "yummy" category, giving a green light for foragers (see the section "The Nnew Narrative" for further information on the categories). But not without knowledge about processing. Additionally, I'm looking into other types of uses, such as pigments and fibres. My goal is to strengthen the bonds to the living surroundings that are here and now. So, the question is, what new knowledge do we need to develop a culture around the alien species, where they can be appreciated?
VV: This is very exciting. It's also a bit like what you said about wild garlic, that if we pick so much wild garlic that it becomes a threatened, it is completely crazy. So, if we can harvest those that should really be removed, that would be absolutely great.

SW: Perhaps the portals, which are meant to inform the public and policymakers about these plants, could also start to provide information on how the plants can be used, not just how they spread. And at the very least, one must be completely sure that the plants are not treated with toxic substances.
VV: I have the impression that contaminated soil is becoming less of a problem, but maybe it's something to consider further: that areas treated with toxicants must be marked. So that one can assume that the other areas are safe, instead of having to worry that all areas are potentially contaminated.

Vigdis Vandvik has approved the final version of the interview, which has been edited for clarity.

The Conflict

I was pleasantly surprised by Vandvik's openness to harvesting and utilising IAPS. As the potential for cultivating a more holistic relationship was discussed, she embraced the notion that foraging could be an effective management method. This shift in perspective, especially considering her position, is quite motivating. Yet, it also underscores a significant concern: the focus and approach of the politics and the systemic contributions to its development. Vandvik describes the limited scope of the research assignment given to NBIC. The strict parameters to which they align their findings, do not encourage alternative or holistic approaches. They are made for easy decision making: is this plant *in* or is it *out*? Because after the researchers have delivered their verdict, politicians can make laws and regulations on this basis, which municipalities and field workers follow. This also shows how the black-and-white-perspective is not based on unwillingness, but probably mostly on a lack of time, resources and knowledge (or necessity).

In a society and culture characterized by rapid consumption and mass-produced goods, there appears to be little incentive to cultivate local, small-scale alternatives. However, within a perspective of self-sufficiency, and ecological consciousness, such initiatives become imperative. Here, the design perspective can serve as a catalyst for the emergence of a novel material culture.

The New Narrative

Nomen est Omen ("The name is in the destiny") has been dedicated to uncovering the untold stories about the IAPS. It is not a means of overlooking that these plants can be problematic and sometimes increasing excessively in the wrong places. However, only with a broader understanding and a solid knowledge base can we assess and discover ways to coexist with these rapidly growing and robust plants.

The concept illustrates how names can evoke associations and assumptions. In this context, categories, or labels, define our actions, influence research, legislation, and cultural perceptions. Through the artistic process in this study, the goal has been to introduce new terminology and alternative classifications that transcend traditional boundaries, by fostering new narratives and perspectives. These are not beautiful stories that I have constructed for each plant, but the process of collecting and managing already existing stories and making them accessible through the artistic work.

<u>The Matrix:</u>

A multitude of stories have surfaced through an extensive process of gathering, analysing, and categorising information. These narratives uncover insights from diverse material cultures, revealing how people historically have coexisted with and utilised these plants in various contexts. To capture the complexity and diversity of these narratives, I have developed an information graphic to visually represent the breadth of the stories at one glance. While rooted in formal knowledge, the goal is not solely to present facts but to prompt reflection on their significance. The complexity encapsulates the richness and intricacy uncovered during the research. Coloured squares denote findings, while blank squares signify areas of uncertainty or absence of knowledge. The circular shape reinforces the concept of a holistic approach, emphasising unity and interconnectedness.

The categories have been defined based on general information and the focus on material culture:

A) EDIBILITY: Yes, Yummy
B) HEALTH EFFECT: Beneficial, Healing
C) HAZARDS: Caution, Danger
D) TYPE: Tree, Shrub, Herbaceous plant
E) FLOWER COLOUR
F) DYE COLOUR
G) FIBRE APPLICATIONS: E.g. textile, paper, or basket-making
H) WOOD APPLICATIONS: E.g. Timber
I) INTRODUCTION: Ballast, Stowaway, Use, Ornamental
J) ORIGIN (BEFORE 1800): Europe, Eurasia, Asia, North America, Africa
K) ECO-BENEFITS: E.g. dynamic accumulator, a nitrogen fixer, attracting wildlife, use in food forest
L) OTHER USES: E.g. soap, landscape shaping,

stuffing material, skin-hair treatment, water-resistant resin, bio-fuel

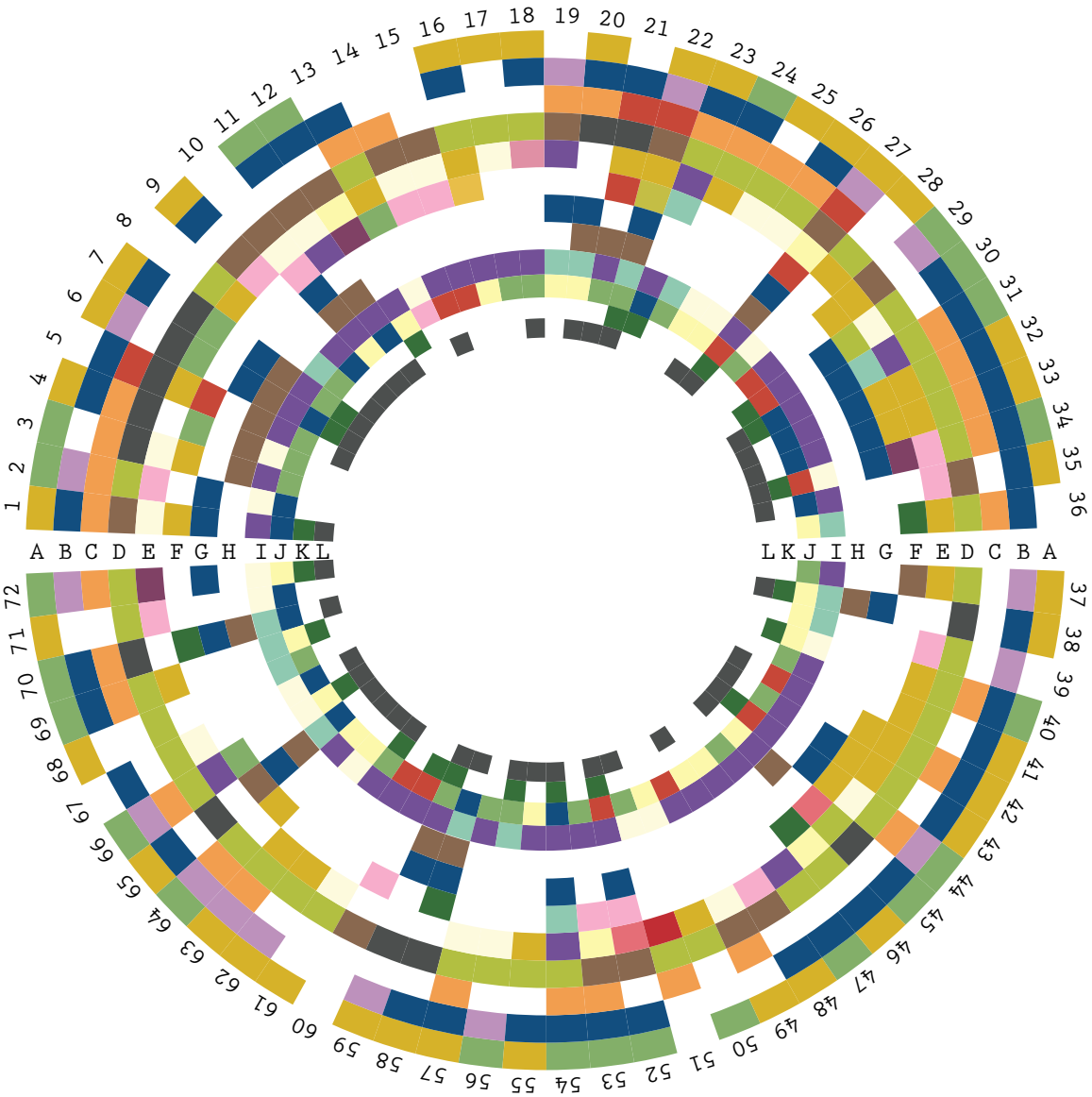
The Flags:
As an embodiment and representation of the narratives depicted in the infographic, a series of textiles have been woven to serve as storytellers. Referred to as "Flags," these textiles symbolize identity, belonging, history, values, and hope, carrying the stories and portraits of fourteen individual plants. They are woven as double-faced fabrics: one side depicts the plant, while the reverse side reveals an alternative narrative highlighting the plant's positive individualities. The physical shift in perspective prompts the emergence of the new narrative. The choice of material and technique holds significant value, emphasising the importance of their historical and cultural significance.

Textiles can serve as metaphors for collected data, as both involve the interweaving of individual elements to create a larger, cohesive whole. Just as fibres are woven together to create a fabric, individual data points can be combined and analysed to form a larger understanding of the topic. The metaphor can also extend to the idea of a textile being a "tapestry" of information, with each thread representing a unique piece of data that contributes to the overall picture. The process of creating a textile can be seen as a way of organizing and interpreting data, much like how data is analysed and presented in the study. This metaphor highlights the importance of considering the relationships between individual data points and how they contribute to the bigger picture, much like how the arrangement of fibres in a textile can impact its appearance and functionality.

The initial flags I made were handwoven and relatively small, produced in the textile workshop at KMD. I find the weaving process rewarding, although meticulous and time-consuming, which may pose a challenge for creating larger collections. With few textile manufacturers left in Norway, it was an exciting opportunity to collaborate with textile manufacture Krivi Vev[26] for the final flags. After weeks of preparations and working on the files, I spent two days at the production site for the final weaving. The flags are woven on the digitalised Jacquard loom, which represents an opportunity to work with a broader field of patterns and qualities. They are made of wool, as the Norwegian national flags traditionally have been. In this study, working with both historical information, individual stories and future collective possibilities, the textile has become a natural medium for materializing and binding together the network of lines.

Project Activities related to *Nomen est Omen*
2019: Project Presentation: *Ar@K symposium*, Westerdals Oslo School of Arts, Communication and Thechnology, Oslo
2019: Project Presentation: *Green square*, NILs Fagdag [Professional Development Day], Vulkan, Oslo
2019: Project Presentation: *To Bauhaus or not to Bauhaus*, NIL Bergensgruppen, Aldea Kunstsenter, Bergen
2019: Seminar: *For vill?* [Too wild?] The Norwegian Botanical Association, NTNU, Trondheim
2019: Collaborative Project: "Bevaring gjennom skjøtsel" [Conservation through care] with Friends of the Earth Norway, focus on *Cotoneaster bullatus* in Landås Food Forest.
2020: Seminar: 2021 *Shifts in Mapping*, Academy of Art and Design FHNW, Basel, CH
2020: Project Presentation: *Fremmedartsseminar* [Alien species seminar], The Norwegian Botanical Association, Litteraturhuset i Bergen
2022: Group Exhibition: *Plant Communitas* 1, Museum in the Park, Stroud, UK
2023: Group Exhibition: *Plant Communitas* 2, Sidney Nolan Trust, The Presteigne, UK

72 PLANTS FROM THE NORWEGIAN LIST OF ALIEN AND INVASIVE SPECIES [FREMMEDARTSLISTEN]



A EDIBILITY
- yes
- yummy

B HEALTH EFFECT
- beneficial
- healing

C HAZARDS
- caution
- danger!

D TYPE
- tree
- shrub
- herbaceous plant
- other

E FLOWER COLOUR

F DYE COLOUR

G FIBRE
- textile
- paper
- basket-making

H WOOD
- timber

I INTRODUCTION
- ballast
- use
- ornamental

J ORIGIN (>1800)
- Europe
- Eurasia
- Asia
- North America
- Africa

K ECO-BENEFITS
- nutrient collector
- nitrogen fixer
- attracts wildlife

L OTHER USES
- Eg: soap
- landscape shaping
- stuffing material
- skin-hair treatment
- water resistant resin
- bio-fuel
- etc

NOTE: Some boxes have more than one answer (f.eks plants with more than one colour, more than one origin or more than one pigment). In these cases one right answer is chosen. Also note that the flower- and pigment colors are representations and simplifications of the true colours.

1. ALASKAKORNELL / Red-osier dogwood / *Swida sericea*
2. ALASKAMJØLKE / Fringed Willowherb / *Epilobium ciliatum glandulosum*
3. ALPEASAL / Vosges whitebeam / Mougeot's whitebeam/ *Sorbus mougeotii*
4. ALPEFURU / (buskfuru)/ (Swiss) mountain pine / *Pinus mugo*
5. ALPEGULLREGN / Scotch Laburnum, Alpine Bea Tree, Alpine Golden Chain Tree / *Laburnum alpinum*
6. BALSAMPOPPEL / Balsam Poplar, Black cottonwood / *Populus balsamifera*
7. BERLINERPOPPEL / Berlin poplar / *Populus × berolinensis*
8. BLADFAKS / Smooth brome / *Bromopsis inermis*
9. BLEIKSPIREA / spirea, meadowsweets or steeplebushes / *Spiraea ×rubella*
10. BLOMSTERMISPEL / Showy Cotoneaster / Many-flowered Cotoneaster / *Cotoneaster multiflorus*
11.BLÅHEGG / Juneberry, Serviceberry ("pigeon berry") / *Amelanchier spicata (korrekt navn er kanskje A. Canadensis)*
12.BLÅLEDDVED / Fly honeysuckle (Honeyberry, Haskap, Blue honeysuckle)/ *Lonicera caerulea (var. Edulis)*
13. BOERSVINEBLOM / narrow-leaved ragwort, South African ragwort/ *Senecio inaequidens*
14. BULKEMISPEL / hollyberry cotoneaster/ *Cotoneaster bullatus*
15. DIELSMISPEL / Diels' cotoneaster/ *Cotoneaster dielsianus*
16. FAGERFREDLØS / Dotted loosestrife / *Lysimachia punctata*
17. FILTARVE / Snow-in-Summer/ *Cerastium tomentosum*
18. GRAVBERGKNAPP / Caucasian stonecrop / *Phedimus spurius*
19. GRAVMYRT / Lesser Periwinkle, Common Periwink / *Vinca minor*
20. GRØNNPIL/ crack willow, brittle willow/ *Salix × fragilis (Salix × rubens)*
21. GULLREGN / Laburnum, Golden chain tree / *Laburnum anagyroides*
22. GYVEL / Scotch broom / *Cytisus scoparius*
23. HAGELUPIN / Big-Leaf Lupin, Lupine / *Lupinus polyphyllus*
24. HAGEPASTINAKK / Garden Parsnip / *Pastinaca sativa hortensis*
25. HVITDODRE/ hoary alyssum, false hoary madwort, hoary berteroa / *Berteroa incana*
26. HVITSTEINKLØVER/ White Melilot, Honey Clover/ *Melilotus albus*
27. HYBRIDBARLIND / Anglojap yew / *Taxus x media*
28. HYBRIDKULEKARSE / Austrian yellow-cress, Austrian fieldcress / *Rorippa ×armoracioides*
29. HØSTBERBERIS / Japanese Barberry / *Berberis thunbergii*
30. JAPAN PESTROT / Sweet Coltsfoot, Japanese sweet coltsfoot, Butterbur / *Petasites japonicus*
31. JÆRLUPIN / Sundial Lupine / *Lupinus perennis*
32. KANADAGULLRIS / Goldenrod / *Solidago canadensis*
33. KJEMPEGULLRIS / Tall goldenrod, giant goldenrod / *Solidago gigantea serotina*
34. KJEMPESPRINGFRØ / Himalayan balsam, Jewelweed / *Impatiens glandulifera*
35. KLASESPIREA / Meadowsweets, steeplebushes / *Spiraea ×billardii*
36. KLISTERSVINEBLOM / Sticky Groundsel, Sticky ragwort / *Senecio viscosus*
37. KRYPFREDLØS / Creeping Jenny, Moneywort, Creeping Joan / *Lysimachia nummularia*
38. KURVPIL / Basket willow / *Salix viminalis*
39. LEGEPESTROT / Common butterbur / *Petasites hybridus*
40. LEGESTEINKLØVER / Melilot, Yellow Sweet clover / *Melilotus officinalis*
41. LUNDNØKLEBLOM / Oxlip / *Primula elatior*
42. MONGOLSPRINGFRØ / Smallflower touchmenot / *Impatiens parviflora*
43. PARKGULLTVETANN / Yellow archangel, artillery plant, aluminium plant / *Lamiastrum galeobdolon galeobdolon*
44. PARKSLIREKNE (Kjempeslirekne + Hybridslirekne) / Japanese knotweed / *Reynoutria japonica*
45. PLATANLØNN / Sycamore (sycamore maple), Great Maple / *Acer pseudoplatanus*
46. PRAKTMARIKÅPE / Lady's-mantle / *Alchemilla mollis*
47. PRYDSTORKLOKKE / Large Campanula, Giant bellflower / *Campanula latifolia macrantha*
48. PURPURSPIREA SPIREA / Meadowsweets or steeplebushes / *Spiraea x rosalba*
49. ROGNSPIREA / False spiraea / *Sorbaria sorbifolia*
50. RUSSEKÅL / Turkish Rocket, Turkish wartycabbage / *Bunias orientalis*
51. RUSSESVALEROT / Swallowwort, pale swallowwort, and dog-strangling vine / *Vincetoxicum rossicum*
52. RYNKEROSE / Beach rose, Japanese rose / *Rosa rugosa*
53. RØDHYLL / Red Elderberry / *Sambucus racemosa*
54. SANDLUPIN / Blue Lupine, Nootka lupine / *Lupinus nootkatensis*
55. SIBIRBERGKNAPP / Siberian Stonecrop / *Phedimus hybridus*
56. SPANSK KJØRVEL / Sweet chervil, Great chervil, (European) sweet cicely, British myrrh/ *Myrrhis odorata*
57. SKOGSKJEGG/ Goat's Beard, Bride's feathers/ *Aruncus dioicus*
58. SITKAGRAN (+Lutzgran) / Sitka Spruce/ *Picea sitchensis (+Picea ×lutzii)*
59. SKJØRPIL / Bullata / *Salix euxina*
60. SPRIKEMISPEL / Spreading Cotoneaster / *Cotoneaster divaricatus*
61. SØLVARVE / Boreal chickweed / *Cerastium Biebersteinii*
62. SØLVTVETANN / Lamiastrum galeobdolon argentatum
63. TAGGSALAT / Prickly Lettuce, milk thistle / *Lactuca serriola*
64. TROMSØPALME / (Persian) hogweed / *Heracleum persicum, Heracleum tromsoensis*
65. VESTAMERIKANSK HEMLOKK / Western hemlock (-spruce) / *Tsuga heterophylla*
66. VALURT / Comfrey / *Symphytum officinale*
67. VASSPEST/ Smal vasspest, American waterweed, Canadian waterweed, pondweed, *Elodea nuttallii*
68. VEIRØDSVINGEL / Chewing's fescue / *Festuca rubra commutata*
69. VINTERKARSE / Yellow Rocket, Winter-cress, Garden yellowrocket / *Barbarea vulgaris*
70. VRIFURU / Lodgepole pine, shore pine, twisted pine / *Pinus contorta*
71. UGRASMJØLKE/ (Fringed, American, slender or northern -) Willowherb / *Epilobium ciliatum ciliatum*
72. ULLBORRE / Woolly burdock, downy burdock/ *Arctium tomentosum*

Weaving in the KMD Textile workshop

Nomen est omen, Flags
Plants Communitas, Museum in the Park, Stroud UK, 2021

Field Notes from an Invisible Landscape
Observations, drawings


Marikåpe
Høymole
Tromsøpalme
Infiltrated and
almost hidden
inside the man-made
landscape of the city.

Drawings

Illustrations for weaving

POWDER
SPRING
DRIED
THE
BEEN
AND
THE
SUITABLE
STORIES

Weaving at Krivi Vev

Processing of the textiles

Hunting wild edible plants with Stephen Barstow and Bærekraftige Liv [Sustainable Living] Landås.

Basket weaving course by Drude Isene

Plant dye course at Osterøy Museum

Plant paper workshop in cooperation with artists and botanists in Botanical Garden Milde

Fellesuroen - Particapartory installation, Science Days Bergen

Exhibition Design course, University of the Arts Berlin

Talk about new edible plants in Norway, Bergen Offentlige Bibliotek

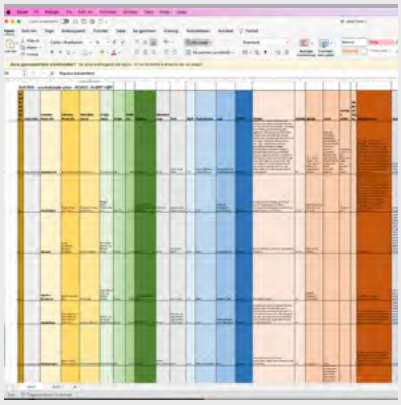
Presenting for The Norwegian Botanical Association, Litteraturhuset Bergen

Presenting *A Colour Mapping of the New Norwegian Flora*, Grouppo Del Colore,Conference in Florence

A selection of activities from the project period

Plantfibre course in Botanical Garden Oslo

Volunteer work in Matskogen på Landås [Landås Food Forest]



A section of the exel-file, that has been the basis for *Nomen est Omen*

Metamorfose
Teaching at KMD Bergen

How to interview a Plant?
Teaching at KMD Bergen

Material Lab 1, Norwegian Wool
Teaching at KMD Bergen

Christmas workshop in cooperation with Friends of the Earth Norway

Fibre course by Drabantbybruket and Matskogen Landås [Landås Food Forest]

Plant Communitas
Museum in the Park, Stroud UK

NOTES

1 University of Bergen. (n.d.). *Vigdis Vandvik.* Retrieved May 23, 2024, from https://www.uib.no/personer/Vigdis.Vandvik

2 “Vegetative life” refers to a state of living that is primarily focused on basic, biological functions necessary for survival, such as growth, metabolism, and reproduction. It is often contrasted with more complex or active forms of life that involve higher cognitive functions, conscious awareness, and active engagement with the environment. Plants primarily engage in photosynthesis, growth, and reproduction without exhibiting behaviors associated with higher animal life forms, such as movement or complex responses to stimuli (ref. E. Coccia).

3 Coccia, E. (2018). *The Life of Plants - A Metaphysics of Mixture*, Polity Press

4 McConnell, D. J., Dharmapala, K. A. E. & Attanayake, S. R. (2016). The Forest Farms of Kandy: and Other Gardens of Complete Design. (Routledge Studies in Environmental Policy and Practice), Routledge

5 *Vikinghagen* (The Viking Garden) is a permanent outdoor facility at the Botanical Garden Oslo, Natural History Museum. Intercultural exchange is not something new: already 1000 years ago, Vikings took souvenirs from the plant and animal kingdom home from their travels, such as coriander, peaches, peacocks and silk. Some crops were imported, while others came as ballast. NHM (18. Nov. 2013), *Vikinghagen*, https://www.nhm.uio.no/besok-oss/botanisk-hage/avdelinger/vikinghagen/

6 Tessem, L. B. (4. July, 2015). *The Vikings’ Green Legacy Bursting with Life and Knowledge.* [In Norwegian: Vikingenes grønne arv strutter av liv og lære], Aftenposten: https://www.aftenposten.no/norge/i/wEK7M/Vikingenes-gronne-arv-strutter-av-liv-og-lare

7 Danielsen, D. I. (17. Oct. 2018). *Large Interdisciplinary Project to Teach Us About the Vikings’ Use of Plants.* [In Norwegian: Stort tverrfaglig prosjekt skal lære oss om vikingenes plantebruk], UiO Naturhistorisk museum: https://www.nhm.uio.no/om/aktuelle-saker/arkiv/2018/1016-prosjekt-om-vikingenes-plantebruk.html

8 "Plant domestication" refers to the process by which humans deliberately select and cultivate wild plants for their qualities, such as increased yield, improved taste, or resistance to pests and diseases. Caused by intentional actions through generations and plant varieties that differ significantly from their wild ancestors.

9 Pallasmaa, J. (2009). *The thinking hand: Existential and embodied wisdom in architecture*. Wiley.

10 Macfarlane, R. & Morris, J. (2017). *The lost Words,* Hamish Hamilton at Penguin

11 Watts, J. (3. Nov. 2018). *Stop biodiversity loss or we could face our own extinction, warns UN.* The Guardian: https://www.theguardian.com/environment/2018/nov/03/stop-biodiversity-loss-or-we-could-face-ourown-extinction-warns-un

12 The Anthropocene is an unofficial geological epoch that describes the most recent period in Earth's history when human activities started to have a significant impact on the planet's climate and ecosystems. This concept suggests that human influence has become so profound that it warrants a distinct geological time interval, separate from the Holocene epoch, which began around 11,700 years ago after the last ice age. A good overview and insight is provided by the natural history Museum, UK:
Pavid, K. (2020, January 20). *What is the Anthropocene and why does it matter?* Natural History Museum. Retrieved from https://www.nhm.ac.uk/discover/what-is-the-anthropocene.html

13 University of Bergen. (n.d.).

14 *Artsdatabanken* is the Norwegian Biodiversity Information Centre (NBIC). They are tasked with conducting risk assessments for species and ecosystems, offering digital tools and services for biodiversity knowledge, and disseminating new insights on species and ecosystems in Norway. www.artsdatabanken.no

15 «The role of the Council on Ethics for the Government Pension Fund Global (GPFG) is to evaluate whether or not the Fund's investment in specified companies is inconsistent with its Ethical Guidelines.»
Council on Ethics for the Government Pension Fund Global. (n.d.). *Council on Ethics*. Retrieved May 23, 2024, from https://etikkradet.no/en/

16 The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) is a global panel of scientists that produces reports on climate change and assesses the knowledge about biodiversity based on available scientific literature: www.ipbes.net

17 The list of alien and invasive species in Norway: https://artsdatabanken.no/lister/fremmedartslista/2023?TaxonRank=tvi

18 The categories used are: no known risk, low risk, potentially high risk, high risk, or very high risk. The group of 72 plants in the "very high-risk" category from 2018 are a part of *Odd New Spring*.

19 These two conventions were the first global environmental agreements, both implemented at the Rio Summit in 1992.

20 Article that Vandvik and colleagues in the invasive species group have written about this topic:
Nuñez, M. A., August, T., Bacher, S., Stoett, P., Vandvik, V., & Meyerson, L. A. (2024). *Including a diverse set of voices to address biological invasions.* Scientific Life, 39(5), 409-412. https://doi.org/10.1016/j.tree.2024.02.009

21 The definitions from the report: **Biological invasion** - a process that transports (moves) and introduces a species outside of its natural range, intentionally or unintentionally by human activities to new regions where it may become established and spread. Native species - A species (animal, plant or other organism) within its natural range, including shifting its range, without human involvement. **Alien species** - A species whose presence in a region is attributable to human activities that have enabled it to overcome the barriers that define its natural range. **Established alien species** - A subset of alien species that have produced a viable, self-sustaining population and may have spread. **Invasive alien species** - A subset of established alien species that spread and have a negative impact on biodiversity, local ecosystems, and species. Many invasive alien species also have impacts on nature's contributions to people (embodying different concepts, such as ecosystem goods and services and nature's gifts) and good quality of life. See Fig. SPM1, https://zenodo.org/records/10521002

22 Magnussen, K., Bruvik, N., Westberg, R., Blaalid, M. & A. Often (2019). *Cost-Benefit Assessments of Measures Against Invasive Harmful Vascular Plants* [In Norwegian: RAPPORT: KOST-NYTTE-VURDERINGER AV TILTAK MOT FREMMEDE SKADELIGE KARPLANTER], MENON-PUBLIKASJON NR. 108/2019 M1569|2019, https://www.menon.no/wp-content/uploads/2019-108-Kost-nytte-vurderinger-av-tiltak-mot-fremmede-skadelige-karplanter.pdf

23 Information from the English authorities about the start of the experiment: https://assets.publishing.service.gov.uk/media/5a7cded040f0b6629523c4d6/scho0209bphy-e-e.pdf.
The project is also described in this article:
Shaw, R. H. (2009). *The life history and host range of the Japanese knotweed psyllid, Aphalara itadori Shinji: Potentially the first classical biological weed control agent for the European Union. Biological Control, 49(2)*, 105-113. https://doi.org/10.1016/j.biocontrol.2009.01.016.

24 In Parliamentary White Paper no. 40 (2006-2007) *Management of the King Crab,* the process from research harvest to commercial harvest is described: https://www.regjeringen.no/no/dokumenter/stmeld-nr-40-2006-2007-/id480559/

25 Implementation note from 2019 by the Norwegian government: *Approval of new food - berries from Lonicera caerulea (traditional food)* [In Norwegian: Godkjenning ny mat - bær fra Lonicera caerulea (tradisjonelt næringsmiddel)], https://www.regjeringen.no/no/sub/eos-notatbasen/notatene/2019/jan/godkjenning-ny-mat-bar-fra-lonicera-caerulea-tradisjonelt-naringsmiddel-/id2627209/

26 Krivi-Vev A/S, established in 1988 in Tingvoll, is a Norwegian textile manufacturing company equipped with modern machinery and employing approximately 20 staff members. While the company specializes in crafting a diverse array of textiles for the traditional folk costume market, it also produces blankets, rugs, throws, and various other home decor items. www.krivivev.no

Interpreting Fallopia Japonica

This chapter is devoted to Japanese knotweed, my childhood " jungle plant" (ref. Introduction). It presents and discusses a study of this single plant: its history, and the material culture that has been surrounding it in its original places of growth, such as Japan and East Asia. In Norway, Japanese knotweed is often referred to as "the monster weed"[1] and it is ranked as one of the world's most invasive species[2]. Despite its long tradition as a food and medicine plant, it is also the plant that costs society the most money overall[3]. In a conversation with permaculturist and forest gardener Benedicte Brun from Matskogen på Landås [Landås Food Forest][4] we have a particular focus on the edibility of plants from "the new flora" and reflect upon food security and alternative ways of cultivating and harvesting food in Norway. We also discuss possible futures of coexisting with the knotweed, as a food plant. The artistic work from this sub-study includes drawing, material experimenting, cooking and collective learning.

The Good, the Bad or the Knotweed

One of the very first rhizomes I ever held in my hand belonged to Japanese knotweed (*Fallopia japonica*, synonyms *Fallopia reynoutria* and *Polygonum cuspidatum*). Its rhizomes can reach lengths up to seven meters, and its shoots can work their way through concrete, while root fragments as small as one centimetre can give rise to new plants. These are probably some of the reasons why this plant has become so successful in reproducing. However, in my grandmother's garden, where I first became familiar with it, it was never an enemy.

The introduction of Japanese knotweed to Europe can be traced back to the first half of the 19th century when Philipp Franz von Siebold, a German physician, botanist, and adventurer, brought over thousand living plant specimens to Europe from Japan between 1823 and 1841[5]. Among these specimens were hosta, hortensia, and Japanese knotweed. While in Japan, Siebold learned about the edible young stems of knotweed and the medicinal value of its roots in Japanese and Chinese medicine. However, in Europe, knotweed was primarily valued as an ornamental plant, and in 1847 it was even awarded a gold medal by the Society of Agriculture and Horticulture in Utrecht for being the most interesting ornamental plant of the year [6]. As a result, it quickly became a popular choice among garden and park owners throughout Europe. The plant most likely arrived in Norway in the 1860s or 1870s[7], and by the time the garden architect suggested using it in my great-grandparents' garden, it was already an established newcomer.

In Europe it had become popular as an ornamental plant and added to botanical gardens and parks. The increasing appreciation and rate, later combined with increasing human building activity (houses, roads and railways) has caused an extensive spread of root fragments and an explosion of the knotweed population. In the

UK the plant has created (tabloid) headlines like *The Plant that ate Britain*[8] or *Lab technician battered wife to death with a perfume bottle then killed himself after being driven mad by invading Japanese knotweed*[9]. In Norway, it has also become the number one enemy of the state, garderners and landlords alike. Hundred and fifty years later, instead of becoming a new local, a native, it has been assigned the status of an invader. In Norway, Japanese knotweed is seen as a burden and an expense for the municipality. Controlling Japanese knotweed is challenging and costly, requiring consistent measures over multiple years to be effective. Present control techniques include covering, cutting, using hot water, or spraying with weed killers (like Roundup[10]). While digging up the plants is possible, it poses a significant risk of spreading. Areas where Japanese knotweed has been eradicated require ongoing monitoring for at least three years after shoot production ceases, as its rhizomes can persist in the soil for extended periods. There have been instances where populations seemingly eradicated by chemical treatment have re-emerged.[11]

One interesting question pops up: if it is such an invasive plant, why has it not been a plague in Japan? After all, it has been growing there for thousands of years. I can think of these four possible reasons:

1. Growth conditions: In Japan, the knotweed has been growing on the sides of volcanoes, where the climate and regular deposits of ash keep it small. Thanks to energy storage in its deep root systems, the plant survives these conditions. But when introduced to rich, misty soil, it grows taller, faster and denser.
2. Cultural use: In Japan, the roots and rhizomes have been utilized for medicine in the past 2000 years and is still an export good. Young shoots are used for cooking and sold at the vegetables-markets. In Europe, on the other hand, most people believe it is poisonous. The truth is that repeated harvests will weaken and contribute to control it.
3. Natural predators: In Japan, a bug (*Aphalara itadori*)[12], feasts almost exclusively on knotweed. In Europe it has no natural predators and can grow unabated, swamping other plants and preventing them from getting light. The bug has recently been introduced to the UK by experts, hoping to have found a measure against the weed.
4. Location: In Japan, knotweed generally grows in the countryside, while western knotweed populations are established close to people, to roads, railways and in cities. Here, human activities, like garden- and construction work, have contributed to scattering and spreading the roots.

Interpreting Fallopia japonica

As history tells us, humans have been moving species across borders for thousands of years. Some species do not survive in a new habitat, others settle. But when or where do they belong? A perhaps somewhat bold reference to the dislocation, is German philosopher, cultural critic and essayist Walter Benjamin's essay *The Work of Art in the Age of Mechanical Reproduction*. Here, Benjamin explores the concept of authenticity and aura, which he finds to be failing through the process of re-location or reproduction. He stresses that: "Even the most perfect reproduction of a work of art is lacking in one element: Its presence in time and space, its unique existence at the place where it happens to be."[13]. As a parallel claim, one could argue that Japanese knotweed, through reproduction out of context, or material culture, has lost its authenticity and aura, and thereby being misread. Benjamin proposes that the uniqueness of an object is inseparable from it being imbedded in tradition, but that the tradition itself is thoroughly alive and very changeable. Correspondingly, one could argue that by allowing these plants to acquire a new cultural value here and now, they could regain authenticity and aura on their new premises.

Interpreting Fallopia japonica was a first take on such a re-establishing of authenticity, in order to gain a *sense of belonging*. It's not hard to imagine that only through a genuine expression – and perception – it is possible to find acceptance and connection. Being authentic fosters real connections and relationships, which can contribute to a sense of belonging and community.

The artistic process in this study contained a long list of conventional and unconventional experiments. Together with my students[14], I tried out an ethnographic method, called *How to interview a plant?*[15]. This was a method for observation and interaction, that seemed a bit strange in the beginning. Also, the students didn´t know exactly how to react to the task but did make some quite good observations and drawings. And, after a couple of attempts, I discovered that – depending a bit on the season– there is a lot to find out about a plant through shorter visits over a couple of days or weeks. That way, it is possible to follow the growth over a period, observe how the ground looks around the plant, how it heals if wounded, how the colours change, which insects it attracts, etc.
To find out *who* the Japanese knotweed really was, I needed to taste, smell, feel – and take it apart. This way, I could start interpreting the plant, and thus understand what kind of material culture we could develop around it in Norway, in order to integrate it into our lives, cuisines and traditions. I have become impressed by this plant, and its range of properties. Therefore, I believe it will be possible to generate interest and appreciation by sharing what I have learned, like:

- how easy it is to make really good food from it – and it makes a lot of food – fast.
- how great it is to dye with – it shows dramatic colour changes based on the pH of the dye solution, and can make both yellow, green and reddish hues.
- how it can be used as a fibre plant to make paper.
- how its healing powers has made it an important cultural plant in Asia.

In my conversation with Benedicte Brun, we touch upon new discoveries in the field of medicine, and we reflect upon how foraging and harvesting can become community-based activities.

Conversation with Benedicte Brun
Benedicte Brun has a degree in environmental and natural resource management from the Norwegian University of Life Sciences (NMBU) and has completed the Permaculture Design Certificate. Through her involvement in the grassroots movement *Global Transition Network*, she has been working in recent years on cultivating perennial food plants and establishing food forests and forest gardens.[16] I first met Benedicte at the beginning of my PhD project when, together with Friends of the Earth Norway, we organized a volunteer effort to remove hollyberry cotoneaster (*Cotoneaster bullatus*), a plant that spreads the disease *Fire blight*[17]. This took place in Matskogen på Landås [Landås Food Forest][18], which is a food forest on municipal land on the slope towards Mount Ulriken. The Food Forest has been under development since 2012, intending to combine good nature management and food production. In this conversation with Benedicte, I wanted to discuss her perspectives on self-sufficiency, regenerative agriculture, and local beneficial plants. From this particular focus, I also wanted to reflect on Japanese knotweed as a potential food and medicine plant in Norway.

Siren Elise Wilhelmsen: I have followed your work in Landås Food Forest for several years and am constantly inspired and happy to experience how much one individuals' visions and knowledge can become a source of learning for so many others. The Food Forest is an initiative by Bærekraftige Liv Landås [Sustainable Living at Landås][19] and is run by a group of individuals. Including you. Could you tell me a little bit about what has motivated you to work with food forests?
Benedicte Brun: The main motivation is to counteract the trend of species and habitat loss. I've seen how agriculture is such a significant part of these destructions. Agriculture occupies half of the world's land surface, and as long as agriculture means monoculture, where almost no other life can exist, well, then we must change the way we farm. Otherwise, we will continue to eradicate and destroy even more nature. Considering the rising population figures, the need for transformation becomes even more crucial.

SW: And has this manifested in your work with the Food Forest?
BB: Yes, I want to develop something that is good for humans, but also for other species. In the Food Forest we work with living seed banks, perennial plants, and perennial habitats for wildlife. I have

been involved in establishing some (forest) gardens, including one in the prison, where I helped make the area more edible and diverse. I have also worked with children in schools and kindergartens, to teach them about cultivation. Now I'm going to work with a school where we will develop methods to make more subjects interdisciplinary and practical by including more of the learning in the garden. Life and cycles in a garden encompass everything.

SW: You mentioned that you want to create a counterculture to today's agriculture. Nowadays, most of us don't "need" to spend time reflecting on how things are grown and harvested. We get what we want at the supermarket. But what should we focus more on in this context?
BB: One of the fundamental problems is that fewer and fewer people are actually producing food. This leads to a lot of knowledge disappearing, and the systems become very simplified. A system like monoculture is highly vulnerable to diseases, extreme weather, drought, or heavy rainfall. The solution is to have as much diversity as possible, both in varieties and species. In the past, every little village had its own variety, and if you have that, you are better equipped if crops are attacked by insects or diseases. There will be significant changes in climate in the years to come. And that also changes the conditions for which life thrives here, including disease-causing organisms that affect our crops. When we hear talk about efficient farming, it's not about utilising the land and resources most effectively; it's about having as few people as possible involved in cultivation and simplifying the systems so that they can be scaled up.

SW: And in these large-scale and simplified systems, what happens to the nutritional content of monoculturally grown food?
BB: If you measure efficiency according to the amount of food grown per area or the density of minerals and vitamins per volume, monocultures and industrially grown food often perform poorly. The vitamin and mineral content become lower relative to the calorie content because the plants are bred for size, shape, or adaptation to industrial processing. In addition, much of the agricultural land today is almost like a desert, with minimal soil life. This also affects the nutrient content of the plants.

A concrete example is from a farmer who had a biodynamic grain production in Eastern Norway. He collected old varieties from different places in the Nordic region and had over 80 varieties, which he cultivated. It took him five to ten years to establish viable populations. He explained that one must eat twice as much of the modern grain varieties to get the same amount of minerals and vitamins as from the old ones. The new varieties are adapted and bred based on principles of industrialisation rather than nutritional content. So, one misses out on the quality that old varieties used to have.

SW: I assume that the industrial way of farming largely aims to keep food prices down. But still, there is a class issue here, not about access to food, but about access to nutrient-rich and healthy food?
BB: Yes, and it's about more than that. Because it's about the power given to supermarkets, which define what we eat and what´s profibale for farmers to grow. A side effect is that we have lost so much knowledge about local food culture, that alternative methods of obtaining affordable and healthy food, such as foraging, cultivation or buying directly from farms, are not widely practiced. Then we need to think differently about how to cook with simple, whole and nutritious ingredients. As well as how we can trade with fewer intermediaries.

SW: And here, regenerative agriculture could be an alternative?
BB: It's said that globally, 70% of agricultural land produces only 30% of the food. Because the large farms are so area inefficient. Regenerative agriculture would require more people in employment. And with more manpower, you can create more complex systems that utilise the soil and land better, providing more nutrition per area. There are many ways to do this.
In poorer countries, often in Asia, it's common to cultivate in systems that resemble forest gardens. Here, plants of different heights are planted beneath each other to utilise the space. It's certainly the most productive. This way, not only

do you produce the most food per area, but also biomass, wood, fibre, and you store carbon.

SW: In addition to creating an environment where multiple species thrive?
BB: Yes!

SW: Some time ago, you conducted an experiment where, for an entire year, you sustained yourself solely on plant-based food produced sustainably in Norway[20]. What were you hoping to achieve with this experiment?
BB: Food that *could* have been produced sustainably in Norway! For example, I did eat imported hazelnuts. But it was a way to demonstrate what a local, plant-based diet *might* look like if we grow what can easily be grown in Norway.

SW: Grain and cabbage for a whole year?
BB: Definitely, yes. Previously people used to eat a lot of that in Norway. But there are many exciting things you *can* grow, and that's what I wanted to highlight. Hemp, for example, is a fantastic plant. It's nutritious, with lots of Omega 3, protein, and dietary fibre, and it's easy to grow. We can grow different types of nuts: large-fruited hazelnuts and walnuts. They grow in Bergen already, in Matskogen på Landås among other places. Jerusalem artichokes, peas, and beans were also grown a lot in the past. And quinoa, buckwheat, and barley are really good and versatile grains. And there's a lot you can make with grains. And with such limitations, you're forced to be creative. And that's very useful, just think about how much we can make with what we already have!

SW: Yes, we have lived in a time without many limitations of that kind, but I think that more and more people find it valuable, for various reasons, to be able to eat food that is grown locally. And in a future scenario with population growth, political unrest, and climate change, we should do what we can to acquire robust and sustainable knowledge about how we live with and off our local landscapes.
BB: It's a bit late to start when the disaster strikes.

SW: And maybe we can even avoid a disaster if we start now?
BB: That's the goal, at least. We can try to de-escalate the situation as best we can by working *with* nature instead of *against* it.

SW: You've mentioned it, but: things take time. The processes of cultivating and creating a sound environment don't happen overnight. So, an important element here is the aspect of time.
BB: Several of the shrubs and trees we've planted in the Food Forest are for the future. In some cases, it may take several decades before they can be harvested.

SW: And what do you think about Norwegian self-sufficiency?
BB: I'm on the board of The Alliance for New Agricultural Policy[21], and we've written a booklet about how we can increase Norwegian self-sufficiency. In that context, I learned that we grow about hundred and thirty times more barley than we consume in Norway[22].

SW: Hundred and thirty times more than we consume? What happens to all that barley?
BB: It becomes animal feed. 90% of the grain we grow becomes animal feed. Yet, animal feed is the food we import the most of. We import three times more raw materials for animal feed than we import vegetables. So, even though it's said that we are 98% self-sufficient in meat, we use the grain we grow, in addition to imported food, to feed these animals. And in addition to the land we use to cultivate animal feed, animal husbandry itself also takes up a lot of space, which could have been used more effectively for regenerative agriculture to grow human food. We are about 6% self-sufficient in fruit and 46% in vegetables.

SW: Discussions about alien species are also intertwined with topics like self-sufficiency, biological diversity, and natural resources. What role do you see them playing in a local ecosystem? Is there a holistic approach?
BB: I usually think that it's not black and white, and that you must always consider the value in relation to the threat. How can we maximize diversity? You need to have some knowledge about each plant to assess whether it works in the situation and contributes to increasing diversity. But if it

spreads and outcompetes other species, it can be problematic, and then we need to intervene. But often, plants are assessed as "high-risk" since they have the characteristics that they spread a lot, but without knowing if they have a negative effect on other species.

Several old cultural plants have been introduced as alien species to monastery gardens, and we benefit greatly from them today. Norway is initially quite species-poor compared to countries further south. So, a holistic approach is to look at the value and diversity, balanced against precautions and the risk of the plant taking over. And from a self-sufficiency perspective, it's actually a luxury with plants that just pop up without us needing to do anything. Because many things are cumbersome to cultivate.

SW: In the three books from "Plants for a future"[23], many thousand plants are considered for future benefit. Several invasive alien species are to be found in these registers, and one of the things that recurs is the proposal for "use in food forests". How do you feel about including these plants in a food forest?
BB: We already have several alien species in the Food Forest, and species that are considered invasive, such as cicely (*Myrrhis odorata*), comfrey (*Symphytum officinale*), apple (*Malus domestica*), currant (*Ribes rubrum*) and chives (*Allium schoenoprasum*). We intend to plant blue honeysuckle (*Lonicera caerulea*). I also have experience with red elderberry (*Sambucus racemose*), rugosa rose (*Rosa rugosa*) and Japanese knotweed *(Fallopia/Reynoutria japonica*) being used, but they are not in our food forest.

SW: And how do you relate to them in this context?
BB: What's important to know is that a food forest is actively managed. We keep a close eye on how the plants are doing, and if they possibly spread. Some may think that once a food forest is established, you just drop by to harvest. But that's not the case. We're in the garden regularly, nurturing it. And some plants we have little control over, like the hollyberry cotoneaster, which spreads as birds eat its berries. Nor is it of any use, on the contrary. So we've been actively working to remove that. With cicely, we've been conscious to collect the seeds before it seeds itself, so we keep it in check and benefit from it.

SW: Do you think it's a lack of care and knowledge that makes these plants problematic?
BB: I believe so. That's why we often see this black-and-white approach to invasive plants. To be on the safe side, we'd rather just burn them, so to speak. But I think it stems from not understanding how they spread and what the alternative to continuous removal is. If these plants can provide food and can be cultivated without us needing to add anything, then perhaps these are resources that could help reduce some imports, for example?

SW: Because then they actually become a local resource and a local opportunity?
BB: Yes, if they can function in such a setting, they can increase biodiversity and provide nutritious food. After all, it's better than eating sprayed foods from monocultures! And in a foraging situation, they are also free.

SW: Can we talk a little bit about Japanese knotweed? You know this plant, which both Stephen Barstow and Euell Gibbons mention in their books as a Japanese beneficial plant[24]. In Japan, it is called Itadori, and has a long tradition as a medicinal and food plant. Yet it has become one of the world's most hated weeds. What is your experience with this plant?
BB: I drink it as tea and take it as a tincture. I dig up the roots when the plant is dormant, dry and boil them, or put them in alcohol. I can't say exactly what health effects it has had, since I often take it with other herbs. But there has been some research on its use against *Lyme borreliosis*[25], and I take it to prevent a possible recurrence of a previous infection. It is also known as one of the plants in the world with the highest occurrence of the antioxidant resveratrol. I have taken some powerful herbal remedies where it has been one of the ingredients, and I experienced very positive effects.

SW: There are several examples of plants that may have the status of useful crops in one place but become invasive in another. It's probably about both the ecosystem they are introduced into and

about tradition and culture. In the case of Japanese knotweed, it is clearly both. From growing in volcanic mountains, where there is little nutrition, to being placed in parks and gardens with nutrient-rich soil. And here, no one harvests the early shoots in the spring or looks forward to pickling or frying them. And there are few who do like you, digging up roots for tea and tincture. How should one proceed to inform, and ultimately create a change in attitude, and a new food culture?
BB: To accept a new plant, one must learn the new tastes, get to know the plants, and prepare them properly. But perhaps one must start with the people who work with the plants, who maintain parks and green urban areas. The goal of these areas should be to have as much biological and edible landscapes as possible. I believe urban landscapes have great potential to become hotspots for biodiversity, if managed and activated in new ways.

SW: Yes, I also believe that maintenance and care are important keywords. Very often, it is precisely in the slightly neglected areas that the alien species get free rein. There, no one feels responsible for taking care of them, and the easy solution is to sporadically remove everything. Perhaps it's often simply a lack of good interaction, opportunities for care, and new thinking for these somewhat strange green spaces?
BB: I think there is an artificial divide between boundaries, ownership, and areas of responsibility. I believe the public should have access to these places.

SW: If you were to have a vision for an alternative future with alien species, what would it look like?
BB: It would be that we gain more knowledge about how we can make use of them. And that more people gain a better understanding of how we can manage and care for our local environments. So that people no longer wish to have manicured lawns, but rather useful green areas for us and for other species.

SW: What do you think it takes for us as a community to get there?
BB: Often it's a disaster that leads to change, but I hope we don't have to go through that. One path that could be exciting, would be to create local management groups to work with local nature so it becomes more diverse and more edible. They could gather invasive plants and process them as food. I think that would be a good way of using the resources. Perhaps we could introduce a weekly foraging day where we forage together and learn from each other. And perhaps more people should read *Utopia for Realists* by Rutger Bregman[26]? He describes how we've become busier and busier, despite all the technology and aids. If we can work a little less, we will be able to spend more time on local and collective activities, such as cultivation and foraging. In addition, I think that more people should have as a profession to work with cultivation, and generally with plants and management of our common green areas.

Benedicte Brun has approved the final version of the interview, which has been edited for clarity.

Project Activities related to *Interpreting Fallopia japonica*:
2019 Co-Learning: *Wild edible plants*, Stephen Barstow and Bærekraftige Liv Landås
2019 Solo Exhibition: *Interpreting Fallopia Japonica*, Process exhibition, Joy Forum, Bergen
2019 Public Presentation: Forskingsdagene [Science days], Participatory installation, *Weed Pavilion*, Festplassen (UiB), Bergen
2019 Project Presentation: Gjenbruksuken [Recycling Week] (City of Bergen, BiR, Friends of the Earth), Bergen Public Library
2021 Video-Lecture, *Rhizomatic Design Approach*, Education in Bergen, Open day 2021

Material explorations
Photo: Niklas Sebastian Alveberg

"The knotweed jungle" in my Grandparents garden in spring time.

Combating Japanese knotweed in Asker
Photo: Mette L´orange

Knotweed material harvested for the Science Days

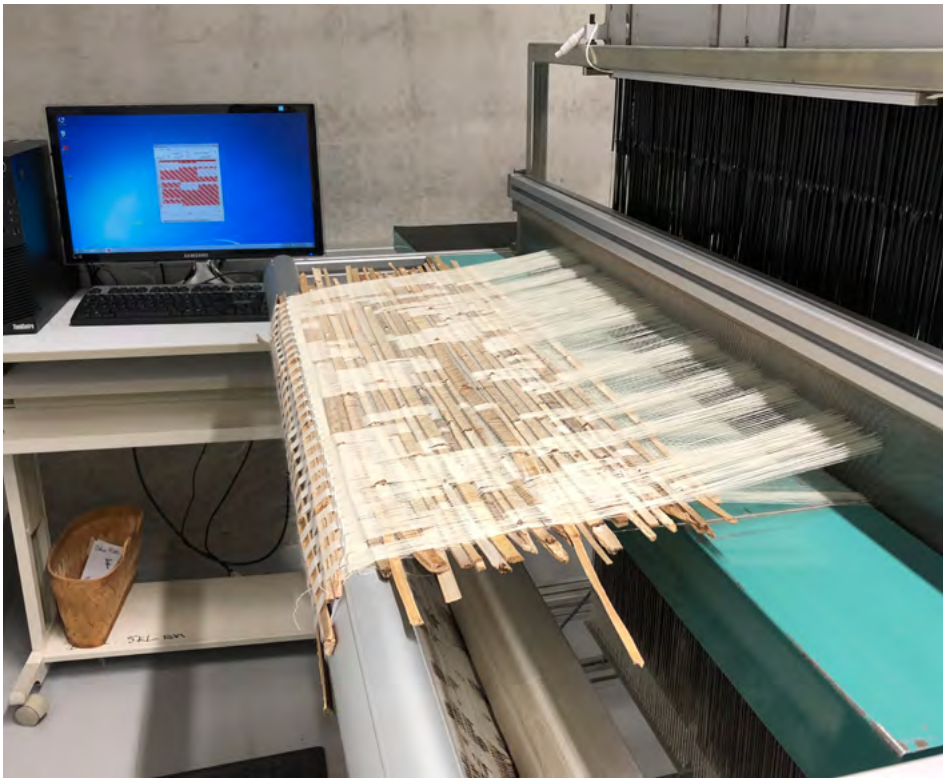
Testing knotweed recipes

Itadori

虎杖

Photo: Line Møllerhaug

Material pre-weaving
KMD Textile workshop



Digital weaving at the KMD Textile workshop

Interpreting Fallopia japonica,
Joy Forum, 2019
Photo: Line Møllerhaug

Interpreting Fallopia Japonica,
Joy Forum, 2019
Photo: Line Møllerhaug

Interpreting Fallopia japonica,
Joy Forum, 2019
Photo: Line Møllerhaug

Interpreting Fallopia japonica,
Joy Forum, 2019
Photo: Line Møllerhaug

Interpreting Fallopia Japonica, Joy Forum, 2019
Photo: Line Møllerhaug

Interpreting Fallopia Japonica, Joy Forum, 2019
Photo: Line Møllerhaug

Fellesuroen preparations
Photo: Jane Sverdrupsen

Collaborating with design students on the preparations for the installation *Fellesuroen*
Images: testing the web-cam

Fellesuroen, Forskningsdagene 2019 [Science days]
Photo: Jane Sverdrupsen

Fellesuroen, Forskningsdagene 2019 [Science days]
Photos: Jane Sverdrupsen

Fellesuroen, Forskningsdagene 2019 [Science days]
Photos: Jane Sverdrupsen

NOTES

1 Nordrum, P. M., Neegaard, D. P., & Audestad, P. (2024, June 7). *The Plant from Hell* [Norwegian Original: Planten fra helvete]. Aftenposten. Retrieved from https://www.aftenposten.no/amagasinet/i/kw3anv/planten-fra-helvete

2 Lowe S., Browne M., Boudjelas S. & De Poorter, M. (2000). *100 of the World's Worst Invasive Alien Species A selection from the Global Invasive Species Database*. Published by The Invasive Species Specialist Group (ISSG) a specialist group of the Species Survival Commission (SSC) of the World Conservation Union (IUCN), 12pp. First published as special lift-out in Aliens 12, December 2000. Updated and reprinted version: November 2004. https://portals.iucn.org/library/sites/library/files/documents/2000-126.pdf

3 Magnussen, K., Westberg, N. B., Blaalid, R., & Vassvik, L. (2020). *Kostnader og nytte ved tiltak mot fremmede karplanter - en oppsummering* [Costs and benefits of measures against alien vascular plants - a summary](Menon-publikasjon nr. 117/2020 M-1795|2020). Menon Economics.

4 Matskogen Landås. (n.d.). *The Food Forest Landås* [In Norwegian: Matskogen Landås]. Retrieved May 23, 2024, from https://www.matskogenlandas.no

5 Bailey, J. P. & Conolly, A. P. (2000). *Prizewinners to pariahs - a history of Japanese knotweed s.l.* (Polygonaceae) in the British Isles. New Journal of Botany, 23, 93-110.

6 Matskogen Landås. (n.d.)

7 Elven, R., Hegre, H., Solstad, H., Pedersen, O., Pedersen, P. A., Åsen, P. A. & Vandvik, V. (2018). *Reynoutria japonica, ecological risk assessment.* [In Norwegian: Reynoutria japonica, vurdering av økologisk risiko]. Artsdatabanken. Retrieved 2023/14/04 from https://www.artsdatabanken.no/Fab2018/N/1130

8 Rudd, M. (July 13, 2014). *The Plant that ate Britain,* The Sunday Times Magazine

9 Dunn, J. (2015). *Lab technician 'battered wife to death with a perfume bottle then killed himself after being driven mad by invading Japanese knotweed*, Dailymail online, found 03.05.24: https://www.dailymail.co.uk/news/article-3271083/Lab-technician-battered-wife-death-perfume-bottle-killed-driven-mad-invading-Japanese-knotweed-not-stopped.html

10 Roundup is a widely used herbicide based on the active ingredient glyphosate, which inhibits a specific enzyme pathway essential for plant growth.

11 Wiik, J. (2022). C*ontrol of Japanese Knotweed: Have you discovered Japanese Knotweed (Reynoutria japonica)? Here are some tips for eradication.* [In Norwegian: Kontroll av parkslirekne: Har du oppdaget Parkslirekne (Reynoutria japonica)? Her får du tips om bekjempelse]. UGRAS, Norsk Landbruksrådgiving, hentet 03.05.24. https://www.nlr.no/fagartikler/plantevern/ostlandet/kontroll-av-parkslirekne

12 Shaw, R. H. (2009). *The life history and host range of the Japanese knotweed psyllid, Aphalara itadori Shinji: Potentially the first classical biological weed control agent for the European Union.* Biological Control, 49(2), 105-113. https://doi.org/10.1016/j.biocontrol.2009.01.016.

13 Benjamin, W. (1999) *The Work of Art in the Age of Mechanical Reproduction*, Illuminations, pp. 214-18 London: Fontana. (Org publication: Schriften, Surkamp Verlag, Frankfurt am Main, 1955)

14 This was a six-week method course titled "Traces" for the design students at BA2, which I co-organised together with PhD fellows Ingrid Rundberg and Siv Lier in 2021.

15 John Hartigan, a cultural anthropologist who has conducted research among plants in Spain and Latin America, situates his ethnographic practice in relation to biological studies of plant sensoria and sociality.
Hartigan, Jr. J. (2017). *Care of the Species: Races of Corn and the Science of Plant Biodiversity*. University of Minnesota Press. Retrieved from ProQuest Ebook Central: http://ebookcentral.proquest.com/lib/utxa/detail.action?docID=5061182

16 A forest garden or food forest is a garden that is built up to function in the same way as a forest, with the difference that it consists mainly of edible plants and other useful crops.

It may contain trees, shrubs, perennials, herbs, root vegetables, climbers and mushrooms. These are planted in a way that provides good interaction between the plants and that makes the garden self-sustaining. One of the great advantages of a forest garden is that it requires little maintenance once established. In addition, perennial plants create habitat for wildlife, as opposed to a field that is replanted every year. More reading about the development of the food forest can be found here in a text about one of the pioneers of the food forest, Robert Hart: https://permakult.no/robert-hart-skoghage-maksimal-avling-for-minimal-vedlikehold/

17 “Fire blight” is a serious bacterial disease that affects many fruit trees and ornamental plants, particularly apple and pear trees.

18 Matskogen Landås. (n.d.). *The Food Forest Landås* [In Norwegian: Matskogen Landås]. Retrieved May 23, 2024, from https://www.matskogenlandas.no

19 Barekraftigeliv. (n.d.). *Landaas*. Retrieved May 23, 2024, from https://www.barekraftige-liv.no/landaas

20 Benedicte’s experiment has not been published, despite documenting everything she ate all year. An excerpt can be found on this page, *Norsk plantekost* [Norwegian plant-based food] which became a kind of follow-up to the experiment: https://norskplantekost.wordpress.com/category/opp-skrifter/

21 ”The Alliance. New Agricultural Policy” is a cooperative organization to change agricultural policy. Benedicte has served on the board as a representative for the Norwegian Permaculture Association. www.landbruksalliansen.no

22 Beitnes, M., Brun, B., Hovden, A. S. & Aas., M. J. (2023). *Norwegian food on Norwegian resources. How to increase self-sufficiency in Norway?* Alliance. New agricultural policy, http://landbruksalliansen.no/wp-content/uploads/2023/11/selvforsyningshefte_ferdig-.pdf

23 Crawford, M. (2012). *Edible perennials: 50 top perennial plants from plants for a future.* Permanent Publications.

Crawford, M. (2012). *Edible trees: 50 top perennial plants from plants for a future.* Permanent Publications.

Crawford, M. (2013). *Edible shrubs: 50 top perennial plants from plants for a future.* Permanent Publications.

24 Barstow, S. (2014). *Around the world in 80 plants.* An edible perrenial vegetable adventure for temperate climates, Permanent Publications

Gibbons, E. (1962) *Stalking The Wild Asparagus,* Alan C Hood & Company

25 Cohut, M. (February 23, 2020). *Lyme disease treatment: 2 herbal compounds may beat antibiotics*, Medical News Today, https://www.medicalnewstoday.com/articles/lyme-disease-treatment-2-herbal-compounds-may-beat-antibiotics?fbclid=IwAR3Xz1bUv1Be49c04Xht2NS_yF764XOY68g-PisFr_q1X11WrfPMcQvi19Tg_aem_ATnLp0Ek3rG-cfAIXi7tO3PftH9SiDm40Ow9f-0__OaCeFlzBUK94oCdcSdWya-wjI-QWUjbi1g9-60CKROpC5LNR#Quinine-and-knotweed-show-promise

26 Bregman, R. (2018). *Utopia for Realists: How We Can Build the Ideal World*, Spartacus Forlag

Colours of the Forbidden Garden

This chapter focuses on the sub-study *Colours of the Forbidden Garden*, and the topics concerning local natural pigments. Here, I present a series of material experiments aimed at exploring and displaying the rich colour spectrum offered by the forbidden and unwanted flora in Norway, as well as reflections on the processes of "colour-making" with natural pigments, and considerations on the future relevance of considering these plants a potential source for colour. But first, I share insights from a dialogue with Ålesund-based fresco artist and conservator Bent Erik Myrvoll, shedding light on natural resources and pigments.

Conversation with Bent Erik Myrvoll

I was introduced to artist and conservator Bent Erik Myrvoll at the colour conference, *XVII Conferenza del Colore*, in Florence in 2022[1]. Here I was fascinated by his perspectives on local mineral pigments and wanted to see if we could build a bridge between our two standpoints in a conversation on natural resources, local colour landscapes and the role of the artist as a mediator. Myrvoll has expertise in lime stone painting, fresco and stucco lustro, and runs the colour lab and artist community *Aggregat* in Ålesund[2]. This conversation took place on Zoom, a year and a half after the colour-conference.

Siren Elise Wilhelmsen: To me, this is a very important conversation to have, because I find that your art practice has strong roots in history while also extending into the future in an exciting and relevant way. In my PhD project I work with plant pigments from the local landscape, while your oeuvre relates to mineral pigments. What motivates you to work with natural colours?

Bent Erik Myrvoll: As a freelance artist, you don't always get assignments that align with your own field of interest, but over the past decade, I have increasingly had the opportunity to delve deeply into subjects that I find fascinating. And it actually stems from environmentalism, a fascination and gratitude for the landscapes I inhabit. I come from a relatively small place and have always spent a lot of time outdoors. Using natural resources brings immense joy. However, extracting non-renewable materials, which is mostly what I work with, always requires a balance. How much should you take, and how to manage the resources you need? We leave marks behind, no matter what we do, although there is a big difference between digging with a shovel and using massive excavators.

SW: Yes, that's indeed a crucial aspect of fresco art, that you depend on limited resources. What happens when natural resources run out? Could you tell me a bit about the earth pigments in Siena, Italy, and what the development has been like there?

BM: Italy has a very special rich soil that has provided certain areas with absolutely fantastic ochre pigments. A proper ochre has been created

only through the Ice Age, through extreme weather changes and extreme pressure, with little access to oxygen. This soil has been built up over thousands of years, developing these colours that are so stable and genuine. It's completely impossible to replicate such an ochre. Siena has therefore been especially known for ochre, and it has probably been sold there for around thousand years. The consumption of pigment accelerated in the fourteenth century, and since then, more and more has been extracted. From the nineteenth century, the mafia began to play their game in Italy, and they took over many of the quarries, where they extracted on a large scale. And since the seventies, it's been empty. I've travelled extensively to Italy, where I've spoken with Italian conservators and artists, and with Zecchi[3], who has been trading pigments in Florence for over a hundred years. And it's just insane that the high quality ochre has been depleted. The ochre we buy today is often "fake", it is an iron oxide, which originates from industrial iron waste and is not really a proper pigment.

SW: But don't you think it's happening almost regardless – as long as there's profit in it, and it's not politically regulated, someone will continue to extract until it's depleted?
BM: Yes, that is probably the case. Blaafarveværket[4] in Modum became depleted. There they extracted the cobalt ore to produce cobalt blue. I often interact with various geologists and mineworkers in Norway and have spoken to Norwegian suppliers of magnetite, which produces a fantastic red colour. These mines are expected to be depleted in about 50 years. And yet they extract and sell it commercially. Among other places, to Italy. The same goes for marble and limestone. And the Italians sell it back to us at a high price in the form of products. While other countries have become much more restrictive on what minerals they sell, Norway has a reputation for selling them cheaply. It's a bit like we're so dazzled by oil that we don't understand the value of anything else. Often, foreign owners are involved, and they certainly don't think about conservation.

SW: Was this the starting point for your PhD at the Norwegian Crafts Institute[5], where you explored new national opportunities?
BM: I've been working with pigments for ten years, but I got a bit of an appetite, yes, in terms of finding my own resources. The research project became an opportunity to delve into and map Norwegian soil and local mineral resources. Now I must keep the exact locations to myself, in order to prevent the industry from emptying the entire source in a flash.

SW: Apart from the colours being locally sourced, is there anything unique about the Norwegian ground? Do the colours differ from other places?
BM: Actually, there are occurrences of the same minerals in different places in the world. Take the mountain formations at Kolsås near Oslo, for example. Geologists believe that this formation broke off, and that the other end can be found in Africa. In these materials you find traces from the origin of the Earth, from the continental shelf that broke, and from the Ice Age. You also find different accumulations in different places. The ochre from Telemark, is somehow the same as in Belgium, where they currently have the purest ochre. In France, they used to have a large quarry, but there was a lot of debris, so that large amounts of water had to be used for purification. Then it creates both pollution and requires a lot of energy to extract the pigments. So, the qualities vary, but genuine earth pigments are gentle and pure. When extracting various substances, significant waste is generated, and these piles of slag can contain very toxic substances, including high levels of heavy metals. I stay away from that. Lead and copper, they go straight into the bloodstream. There are several examples of artists who have died from acute lead poisoning. And others have gotten cancer. Therefore, I'd rather be a bit "boring" and work with natural pigments.

SW: Is this also about holding on to old recipes and ways of mixing the colours?
BM: Yes, to some extent it does, because that is what still works. As I mentioned, where I can do without heavy metals by using a different recipe, I do it. Cadmium yellow is one of those pigments that is extremely toxic, and I don't use it at all. There are also some up-and-coming alternatives to Cobalt. But these alternative pigments are,

of course, very expensive. 2000-5000 NOK per kilo. That makes quite expensive paintings. The public should also have an understanding of what material choices actually mean. A stucco lustro painting doesn't use acrylic or oil as a binder, the pigment is chemically bound to the stone. The colours become incredibly durable. Such a painting could last for 10,000 years. It's absolutely unbeatable.

SW: Do you now exclusively use your own pigments?
BM: As far as possible, I use pigments I have found and prepared myself. But if I can't make the colours, I have other pigments I can add, in order to build up the shades I need. Right now, I've actually gotten hold of some real Cobalt from Blaafarveværket. I also have an ochre that is over a hundred years old. That one must be used in just the right place.

SW: A core issue for most of us involved in artistic research, is to reflect upon how the new knowledge and methodology developed through the research project has changed the post-research practice, and the way we work and communicate. To what extent has the research project influenced your art practice?
BM: Well, actually, it has influenced it substantially. I might have thought that after the research project, I could go back and paint as I did before, but I can't. It feels completely wrong. What I'm focused on now is expressing the colour. I build it up layer by layer, trying to saturate the cotton canvas with colour. It often takes ten layers before it is a pure colour field. Nowadays, I create a lot of large paintings, composed of such colour fields. The colours represent landscapes but are detached from the form. It's the colour relationships, and the balance between the colours, that are depicted. A painting called "1100 meters above sea level" explores the colour scale of a flora growing in the Norwegian mountains: this moss, that stone, this barn, that flower. It creates harmonies.

Queen Sonja attended a course here at *Aggregat*, and she mentioned that exact painting – that it really resonated with her. There is something about those pigments that feels very accessible. It is simply a piece of nature itself.

SW: I think it also demonstrates art's unique ability to shed light on important topics.
BM: Yes, for me, it fundamentally concerns the degradation of common resources. The notion of nature as a collective responsibility and common asset is endangered. There is a troubling trend where a few individuals profit from exploiting resources that rightfully belong to everybody. This situation is truly alarming.

Art does not always need long texts or complicated language to convey an important message in a powerful way. Beautiful aesthetics can also be political. So, when you are working with art, aesthetics is one of your most important tools. We should not forget that. That is why we spend many years in school, whether you are a designer or an artist, we are drilled in developing an aesthetic language. This should not be taken too lightly. By working with the materials, delving deep into the substance, I can show something that is incredibly beautiful, that makes us wonder about connections and meanings. Why does it resonate with us? Why does it trigger us? Well, because it is completely real – it is not a theory.

SW: That is very true. And your approach to the material is probably influenced by the fact that you work both as an artist and a craftsman. Do you feel that these two roles complement or compete with each other?
BM: Since I receive commissions related to restoration and large projects involving multiple people on the team, I have worked closely with geologists, conservators, master masons, and painters who use old techniques. I gain insight into many layers of the work, from forecasts of when a resource will be depleted to testing the durability of a pigment. I have equipment to expose pigments to UV rays, simulating up to hundred and fifty years of sunlight exposure. Within a few days, this process provides insight into how a pigment will behave over several generations. I also offer this to conservators, examining colours that may have been overpainted for fifty years and are now thirty to forty percent different from the original. Then UV lighting can remove yellowing and colour shifts, to bring out the right tone. Such colour analyses are educational. I always test the pigments with

lime as a binder, since weak pigments cannot withstand the pH value of the lime. Through these dialogues, I also have the opportunity, and it becomes quite natural, to gather as much information as possible before I start creating paintings.

SW: Speaking of lime, it's not just that you extract your own pigments. You also extract the lime. And last year, you participated in an experiment where you were burning Pacific oysters. Pacific oysters are considered an invasive alien species in Norway. Could you tell me a bit about this project?
BM: Yes, this is a really exciting project where I test the possibility of using these oysters as a lime resource[6]. What is unique about the project is that it fundamentally differs from other lime extractions because these oysters are a renewable resource. All other lime we extract creates physical interventions in nature, which can be quite extreme. It's always very, very dependent on gentle extraction and management, and also the restoration of the local landscape afterwards. Unscrupulous actors just leave huge holes in nature.

SW: Yes, there will be open wounds. And while limestone doesn't grow back, the population of Pacific oysters does. What is the potential of this project?
BM: The Pacific oyster has become an environmental disaster, but a boon for cultural heritage preservation. We will first use it within cultural heritage preservation and arrange some courses in various churches. The lime content is actually even a bit higher than in limestone. It's almost pure lime! After being burned on bonfires, in weather and wind, for one to two days, only lime powder remains. I mix this with water to make so-called "slaked lime", also known as calcium hydroxide. Such a mixture ideally should soak for several years, but I have already tested it a bit, and it works well. In our project, I have primarily tested it for lime, but the oysters can also be eaten, which is another benefit. There is interest in the project, and we will present it internationally, hoping to get some EU funding. So, exciting things are happening around this now.

SW: Is it a local group that extracts the oysters, or how are you organized?
BM: It has become an "Oyster cleanup effort" in Østfold and Vestfold[7]. It's a voluntary effort, and anyone can participate, including school students. It's a "Cultural Schoolbag" (DKS) project, this is a national program that gives all pupils in Norway access to professional art and culture while in school. They are taken out of class to participate. Now, a large kiln is being built to handle all the oyster. It will be housed in a small timber-framed house, which will be painted with beautiful colours. I'll be involved in painting with lime paint and Norwegian pigment, so it will be very thorough. And yes, hundreds of tons of Pacific oysters will be burned there. It is crazy, because there is just so much of that oyster. It displaces the common shells, like flat oysters and mussels, and takes over areas for bird life as well.

SW: How long does it take before the oyster is back in an area you've harvested from?
BM: It seems to reach sexual maturity about a hundred times faster than a mussel. It reproduces rapidly, producing shells almost instantly. The forecasts are quite extreme, you know. It spreads fast. It crawls up the coast from the south and heading past Stavanger and Bergen, now they have actually found the first occurrences here in Ålesund.

SW: Do you think we are talking about local burning in every city quite soon?
BM: Yes, it is really engaging. To me, it´s probably the most exciting environmental project I have been involved in. Atle Ove Martinussen was the one who started this. He is a diver as well as a cultural worker. He has taken a lot of pictures, has experience from museums and cultural heritage conservation, and has worked at the Norwegian Craft Institute for many years. It was probably the sum of all that, that made him start this. He has really promoted the idea. In the Pacific, it's quite logical how they extract lime. Unlike our mountainous regions, they utilise their abundant oyster resources for lime production.

SW: So you have learned from the homeland of the Pacific oyster?

BM: Yes, the first kiln we built was named "The Jamaica kiln". We copied the one they use, which you build up with firewood. In fact, even in New York, they have lime from Pacific oysters in many of the buildings. It's quite interesting. They've probably been doing it for hundreds of years. Due to the weather, we have to do it a bit differently. We're building up our own tradition here. A local variation.

SW: I see this as a pioneer model, and a very good example of how to address such a challenge. Because it's a challenge when a species emerges that completely disrupts the entire ecology. But, instead of being overwhelmed by the problem, a positive and solution-oriented approach is being developed. And while you may never return to the way things were, by giving resistance to that species, you are creating space for other species in the ecosystem, which is probably the most important thing. Moreover, you have a resource that you no longer have to extract from elsewhere.
BM: If we manage it well, the Pacific oyster can actually become a very important resource. And we need long-term, good models for managing natural resources.

Bent Erik Myrvoll has approved the final version of the interview, which has been edited for clarity.

Plant Dye as a Historical Local Activity
Bent Erik Myrvoll´s story regarding the depletion of mineral resources and his concerns about the toxicity of certain chemical pigments highlight the significance of plant-based pigments. While plants may not be suitable for all applications, such as limestone paint, they offer promising alternatives for textiles, inks, water paints, some wall paints, food colouring, and cosmetics. In the following sections I will give insight into my learning process through the making of colours.

Historically, plants, animals and minerals have formed the basis for colour making. During my research I have found information about the deep-rooted history of natural dyeing using different parts of plants. This has provided insight into processes, as well as the material cultures surrounding these activities and describing their value and purpose. In Norway, like much of Europe, evidence of plant-dyed cloth date back to the Late Roman Iron Age[8]. Local plants were predominantly used, though imported colorants like alizarin (*Rubia tinctorum*) and indigotin (*Isatis tinctoria*) were also identified[9]. Despite this, interest in natural dyes waned with the advent of synthetic alternatives in the twentieth century[10]. Early preservation efforts by figures like Hilda Christensen helped document traditional dyeing methods, emphasising local flora. In her *Textbook on dyeing with plants* [Lærebok i farging med planter] from 1908, her main focus was directed towards local barks, leaves, twigs, herbaceous plants, and lichens[11]. This book has become the fundament for my dye-experiments through the artistic process.

Colour Hunting – Building New Relations
A century of industrialisation has significantly altered both the environment and human interactions with it, which also makes the starting point for a colour hunt markedly different from how it was during Hilda Christensen's time.
The colour experiments conducted, has been a creative take on the development of an updated knowledge about local plant colours.

Collecting dyestuff (the colour giving elements from plants) involves a direct interaction with the natural environment. It also involves knowledge about the plants one is hunting. It can be hard to find a plant you don't know. I have learned many plant names and the identification of different leaves, bark and flowers, through my countless "colour hunts". As these have mostly been a solitary activity, or with people knowing less about the plants than I did, I have found great support in plant identification through the app *Artsorakelet* [The Species Oracle][12].

Colours and Time
When it comes to plant dyeing, the time aspect and seasons play a crucial role in the process. Different plants produce pigments and chemicals at different times of the year, and the concentration of these substances can vary depending on the season. Additionally, seasonal changes can affect the availability of certain plant materials, as well as the conditions for harvesting

and processing them. Then, understanding the seasonal cycles of the plants is essential for maximizing the quality and quantity of dyes extracted from them. The time aspect in plant dyeing also involves patience and observation, as the process often requires allowing the dyestuffs to steep or ferment over time to achieve the desired colour intensity and fixation onto the fibres.

Outlining the Palette

The initial colour research concentrated on forty-five of the IAPS from the research group. Mapping historical and contemporary usage, along with descriptions and indications of colour extraction, served as the foundation for the practical colour study. The tests were conducted for textile dyeing purposes, with the hope that the palette could have broader applications. Hilda Christensen's textbook provided the basis for all recipes and the process of creating dye samples. It's important to note that these were studio experiments and not laboratory tests. Chemical properties, lightfastness, wash fastness, and systematic examinations of each individual dye were not conducted. The primary focus of this preliminary study was to outline the colour palette. A diverse array of hues and colour intensities was attained through the utilization of natural dyes with different mordants. Alum served as a pre-mordant in a distinct immersion bath for the fibres, while vinegar, ammonium chloride, iron, and potash were employed as separate post-mordants. The study resulted in a total of 132 swatches, including frequent examples of yellows, greens, greys, beiges, and browns. Apricot, rose, and orange are less common, while purple is only found twice, turquoise and red once each. A detailed description of the experiments can be found in the paper *Plants out of place? A design-driven investigation of colour and material possibilities within a group of "invasive alien plant species" in a Norwegian context*[13], that I wrote for the international Colour Conference in Florence in 2022.

From Learning to Envisioning

Through the first experimentation of "outlining the palette", I learned a lot about how the colours behave, when and how I could gather them, and what preparations were necessary. After having learned the basics, I was craving for a more intuitive and playful process with the colours. For me, this was a process of envisioning the colours and reflecting upon their meaning. From the first encounter, which was more of a skills development, the next round could have a more intuitive and playful approach. This has been a key discovery, or realisation to me: it takes time to get to know, to understand and to learn. But once you have established those new relationships, once you have started to actually know the plants, you can hardly pass by without saying "hello". And this is what has happened through the colour-hunts and the colour-experiments: that once I know when the pigments are good, I crave to collect them, and I feel thankful for the season, for the growth, and for that particular plant.

Future Relevance

The act of colouring with plants, has potential as a social and collective activity. It activates our relation to our living surroundings, and since they often grow in urban areas, there´s no need to travel far to find them. Through the interaction, we gain knowledge about what a plant is called, how and where it grows, how it smells, what it feels like and when it can be harvested for pigments. The colours can be used to dye textiles or, through a similar procedure, become lake pigments for watercolours and inks[14]. Other potential uses encompass food colouring, architectural and interior paints, natural stained paper, and colorants for cosmetics and pharmaceuticals. These ideas should of course be regarded as suggestive rather than definitive.

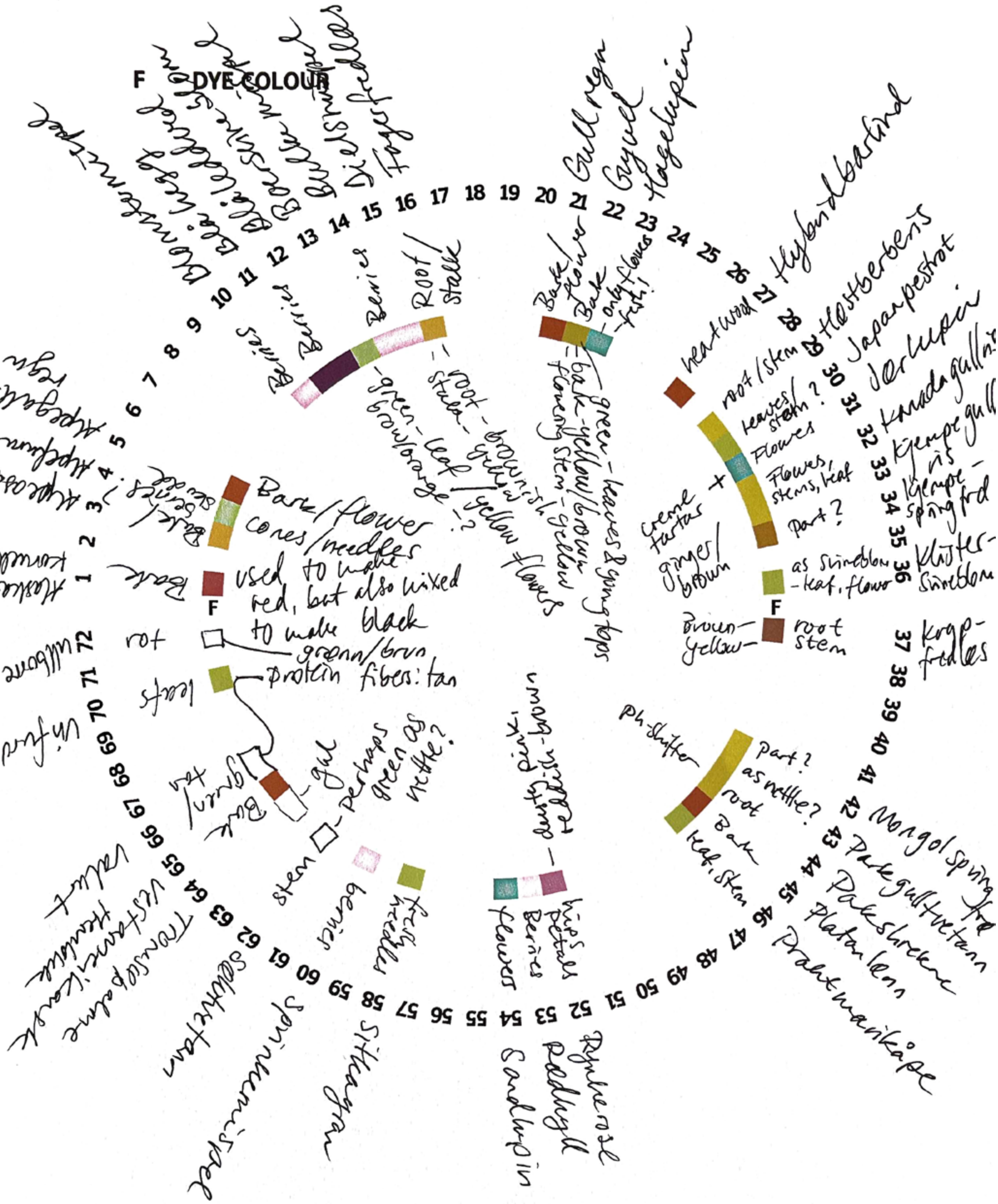
Through a personal approach or co-operative interaction, we create alternatives to imported and non-biobased goods. And, by tying new bonds and relationships based on harvest and care, we are engaging in the development of a new material culture, based on local resources and ecosystems. By manufacturing our own goods – even if only a small part of them – consumption is replaced by creation.

The aim of this sub-study has been to enhance both my personal and our collective

comprehension of the potential for engaging with IAPS as natural resources and materials for colour production. It also seeks to expand the colour palette and its diversity, derived from our contemporary landscapes and raise awareness about the potential for a holistic approach to colour production across various scales. By fostering a new understanding, these interactions can pave the way for the development of new material cultures, with relevance also to other communities and ecosystems. Finally, this study serves as an invitation for further exploration rather than a blueprint.

Project Activities related to *Colours of the Forbidden Garden*

2019 Co-Learning: *Dye with local plants* (2 days), Monica Ravnanger/Osterøy Museum
2020 Co-Learning: *The art and science of natural dyes*, Ingrid Aarseth, KMD, online participation
2020 Workshop: *D.i.y or die, Bundle dye workshop*, Kiyoshi Yamamoto, Studio 207/ PIKSEL, Bergen
2022 Paper and Presentation for the International Colour Conference: *XVII Conferenza del Colore*, Florence
2023 Essay for Book: *Fieldnotes from the forbidden garden*, *Biocolours*, Aalto University Press



F DYE COLOUR
Bark/flower
cones/needles
used to make red, but also mixed to make black
grønn/brun
protein fibers: tan
green - leaves & young tops
heartwood
root/stem
Flowers
Flowers, stems, leaf
Part?
creme tartar
ginger/brown
as Svineblom - leaf, flower
Brown-Yellow
root stem
F
Ph-Shifter
Part?
as nettle?
root
Bark
leaf, stem
hips
petals
Berries
flowers
stem
berries
needles
Bark
Berries
Root/stalk
Gullregn
Hylleblomst
Japanpestrot
Kanadagullris
Kjempegullris
Mongolspringfrø
Parkgulltvetann
Parkslirekne
Platanlønn
Prydmarikåpe
Rynkerose
Sandlupin
Sitkagran
Spirea
Vinranke

1. ALASKAKORNELL / Red-osier dogwood / *Swida sericea*

3. ALPEASAL / Vosges whitebeam / Mougeot's whitebeam/ *Sorbus mougeotii*
4. ALPEFURU / (buskfuru)/ (Swiss) mountain pine / *Pinus mugo*
5. ALPEGULLREGN / Scotch Laburnum, Alpine Bea Tree, Alpine Golden Chain Tree / *Laburnum alpinum*

10. BLOMSTERMISPEL / Showy Cotoneaster / Many-flowered Cotoneaster / *Cotoneaster multiflorus*
11.BLÅHEGG / Juneberry, Serviceberry ("pigeon berry") / *Amelanchier spicata* (korrekt navn er kanskje A. Canadensis)
12.BLÅLEDDVED / Fly honeysuckle (Honeyberry, Haskap, Blue honeysuckle)/ *Lonicera caerulea (var. Edulis)*
13. BOERSVINEBLOM / narrow-leaved ragwort, South African ragwort/ *Senecio inaequidens*
14. BULKEMISPEL / hollyberry cotoneaster/ *Cotoneaster bullatus*
15. DIELSMISPEL / Diels' cotoneaster/ *Cotoneaster dielsianus*
16. FAGERFREDLØS / Dotted loosestrife */ Lysimachia punctata*

21. GULLREGN / Laburnum, Golden chain tree / *Laburnum anagyroides*
22. GYVEL / Scotch broom / *Cytisus scoparius*
23. HAGELUPIN / Big-Leaf Lupin, Lupine */ Lupinus polyphyllus*

27. HYBRIDBARLIND / Anglojap yew */ Taxus x media*

29. HØSTBERBERIS / Japanese Barberry */ Berberis thunbergii*
30. JAPAN PESTROT / Sweet Coltsfoot, Japanese sweet coltsfoot, Butterbur */ Petasites japonicus*
31. JÆRLUPIN / Sundial Lupine */ Lupinus perennis*
32. KANADAGULLRIS / Goldenrod */ Solidago canadensis*
33. KJEMPEGULLRIS / Tall goldenrod, giant goldenrod */ Solidago gigantea serotina*
34. KJEMPESPRINGFRØ / Himalayan balsam, Jewelweed */ Impatiens glandulifera*

36. KLISTERSVINEBLOM / Sticky Groundsel, Sticky ragwort */ Senecio viscosus*
37. KRYPFREDLØS / Creeping Jenny, Moneywort, Creeping Joan */ Lysimachia nummularia*

42. MONGOLSPRINGFRØ / Smallflower touchmenot */ Impatiens parviflora*
43. PARKGULLTVETANN / Yellow archangel, artillery plant, aluminium plant */ Lamiastrum galeobdolon galeobdolon*
44. PARKSLIREKNE (Kjempeslirekne + Hybridslirekne) / Japanese knotweed */ Reynoutria japonica*
45. PLATANLØNN / Sycamore (sycamore maple), Great Maple */ Acer pseudoplatanus*
46. PRAKTMARIKÅPE / Lady's-mantle / *Alchemilla mollis*

52. RYNKEROSE / Beach rose, Japanese rose / *Rosa rugosa*
53. RØDHYLL / Red Elderberry / *Sambucus racemosa*
54. SANDLUPIN / Blue Lupine, Nootka lupine / *Lupinus nootkatensis*

58. SITKAGRAN (+Lutzgran) / Sitka Spruce/ *Picea sitchensis (+Picea ×lutzii)*

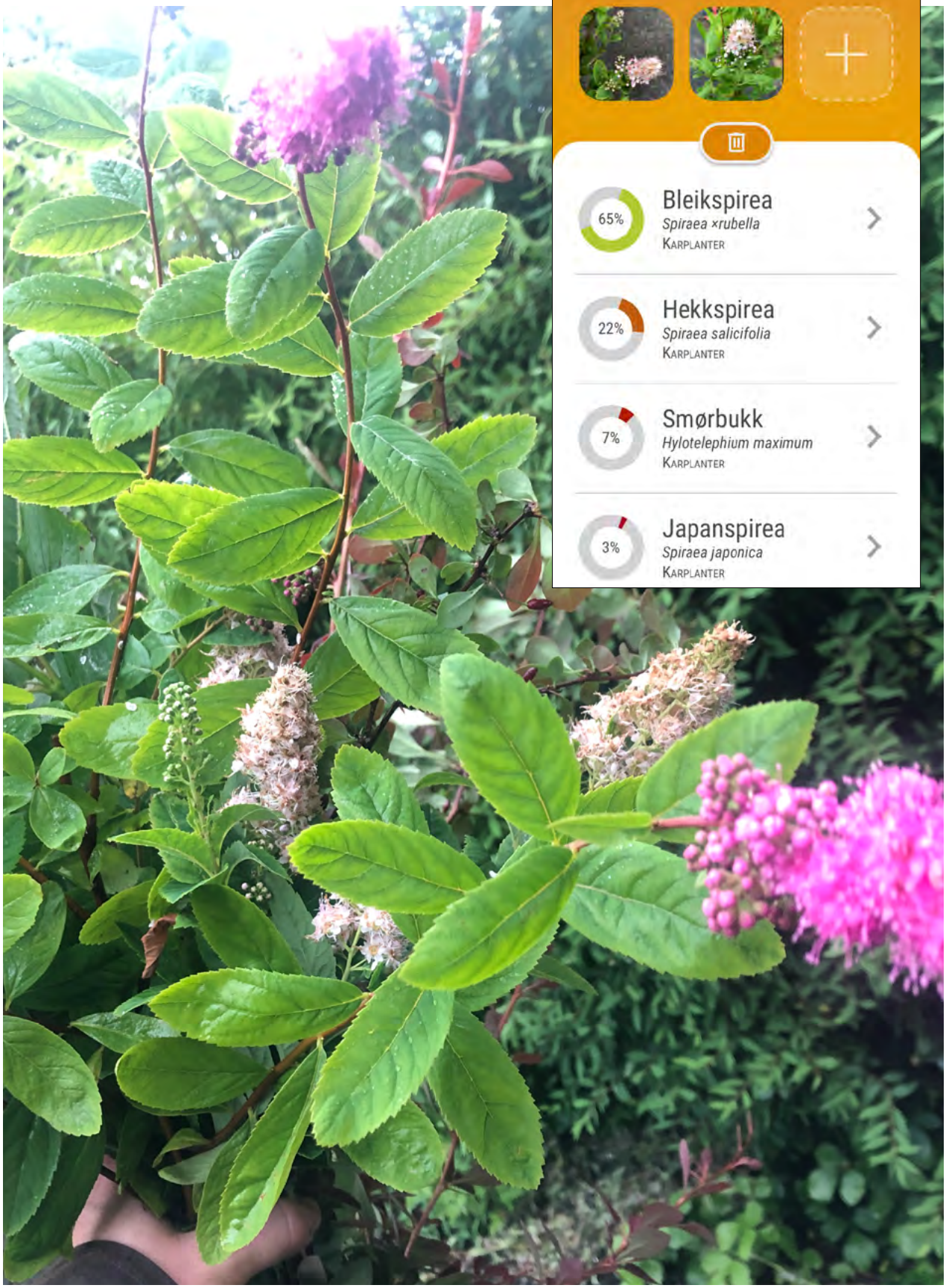
60. SPRIKEMISPEL / Spreading Cotoneaster / *Cotoneaster divaricatus*

65. VESTAMERIKANSK HEMLOKK / Western hemlock (-spruce) */ Tsuga heterophylla*

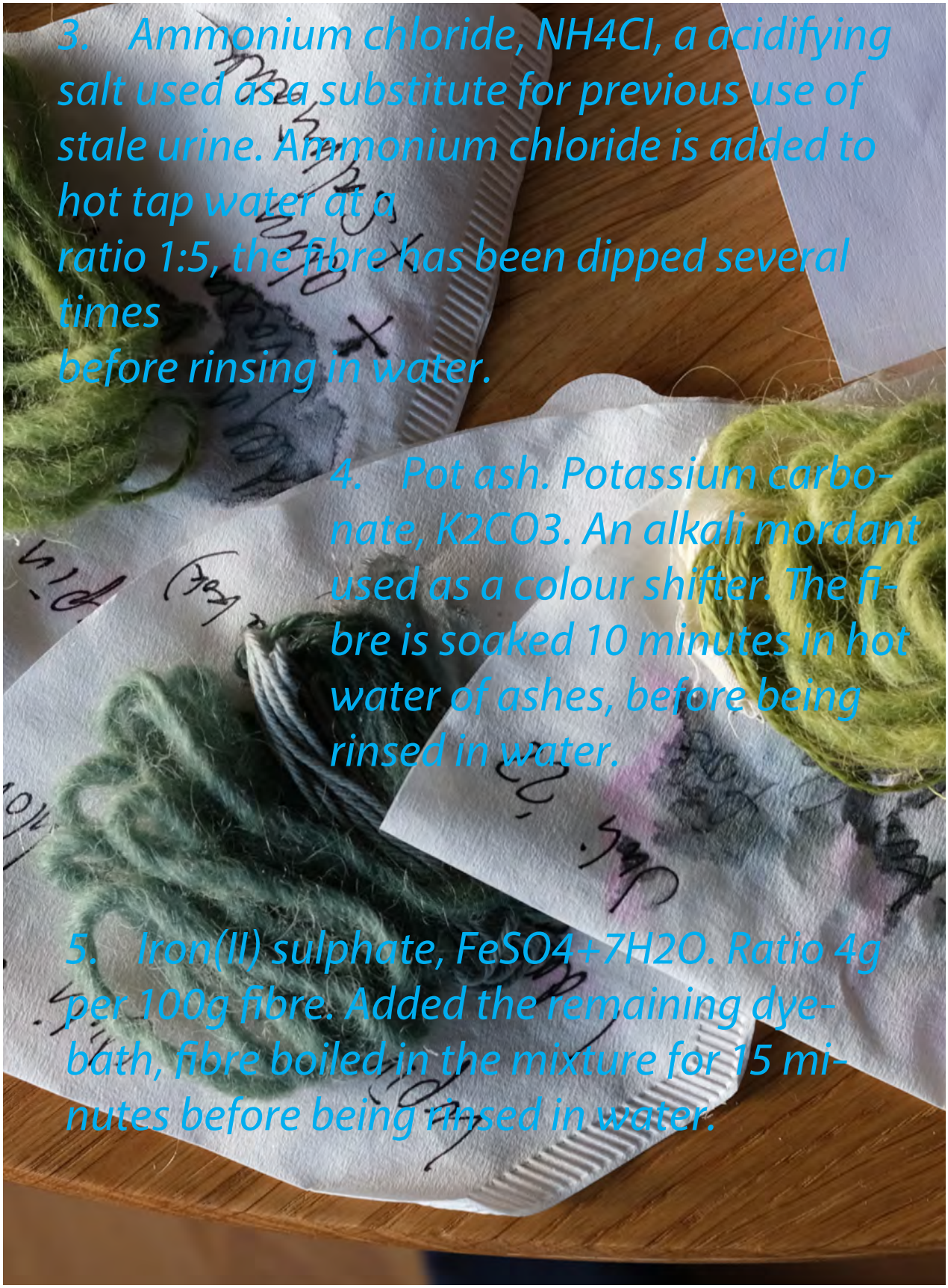
70. VRIFURU / Lodgepole pine, shore pine, twisted pine */ Pinus contorta*

Studiowork

Colour hunt
Right: Plant identification
Artsorakelet [Species Oracle], app


ice+ 4G
20:58
41 %
65%
Bleikspirea
Spiraea ×rubella
KARPLANTER
22%
Hekkspirea
Spiraea salicifolia
KARPLANTER
7%
Smørbukk
Hylotelephium maximum
KARPLANTER
3%
Japanspirea
Spiraea japonica
KARPLANTER

Plantdye results
Use of mordants



3. Ammonium chloride, NH4Cl, a acidifying salt used as a substitute for previous use of stale urine. Ammonium chloride is added to hot tap water at a ratio 1:5, the fibre has been dipped several times before rinsing in water.

4. Pot ash. Potassium carbonate, K2CO3. An alkali mordant used as a colour shifter. The fibre is soaked 10 minutes in hot water of ashes, before being rinsed in water.

5. Iron(II) sulphate, FeSO4+7H2O. Ratio 4g per 100g fibre. Added the remaining dyebath, fibre boiled in the mixture for 15 minutes before being rinsed in water.

Plantdye results, Lupine
Microscopic image by: Julia Lohmann and Siren Elise Wilhelmsen

Plantdye results, Japanese knotweed
Microscopic image by: Julia Lohmann and Siren Elise Wilhelmsen

Dye results

				(INDICATION)	SULFATE	CHLORIDE	CARBONATE	SULPHATE	VINEGAR
1. ALASKAKORNELL / Red-osier Dogwood / *Swida sericea*	Twig	Fresh	June	Yellow / Grey	x				
2. ALPEASAL / Mougeot's Whitebeam/ *Sorbus mougeotii*	Bark	–	–	Yellow / Brown					
3. ALPEFURU / (buskfuru)/ (Swiss) Mountain Pine / *Pinus mugo*	Needle	–	–	Green					
(VRIFURU / Lodgepole Pine / *Pinus contorta)*	Cone	–	–	Brown					
4. ALPEGULLREGN / Scotch Laburnum / *Laburnum alpinum*	Flower / Leaf	–	–	Yellow					
5. BLEIKSPIREA / Meadowsweets / *Spiraea x nobella*	Twig	Fresh	June	Apricot	x				
6. BLÅHEGG / Juneberry, Serviceberry / *Amelanchier spicata*	Berry	–	–	Purple					
7. BLÅLEDDVED / Fly Honeysuckle/ *Lonicera caerulea (var. Edulis)*	Berry	–	–	Purple					
8. BOERSVINEBLOM / Narrow-leaved Ragwort / *Senecio inaequidens*	Leaf	–	–	Green / Yellow					
	Flower	–	–	Brown / Orange					
9. BULKEMISPEL / Hollyberry Cotoneaster/ *Cotoneaster bullatus*	Leaf	Fresh	May	Beige / Brown	x				
(BLOMSTERMISPEL / Showy Cotoneaster / *Cotoneaster multiflorus)*									
(DIELSMISPEL / 'Diels' Cotoneaster/ *Cotoneaster dielsianus)*	Root	Fresh	May	Rose	x				
(SPRIKEMISPEL / Spreading Cotoneaster / *Cotoneaster divaricatus)*									
	Berry	–	–	Beige / Rose / Brown	x				
10. FAGERFREDLØS / Dotted Loosestrife / *Lysimachia punctata*	Flower	Fresh	July	Yellow / Green	x				
	Root	Fresh	July	Beige / Brown	x				
11. GRØNNPIL/ Crack Willow / *Salix × fragilis (Salix × rubens)*	Leaf	Fresh	July	Yellow / Green	x				
12. GULLREGN / Laburnum / *Laburnum anagyroides*	Bark	–	–	Brown					
	Flower	–	–	Yellow/ Orange					
13. GYVEL / Scotch Broom / *Cytisus scoparius*	Stem w/ buds	Fresh	April	Green	x				
	Flowering stem	Fresh	July	Green	x				
14. HAGELUPIN / Big-Leaf Lupin, Lupine / *Lupinus polyphyllus*	Blue flowers	Fresh	July	Green/Turquoise	x				
(JÆRLUPIN / Sundial Lupine / *Lupinus perennis)*									
(SANDLUPIN / Blue Lupine / *Lupinus nootkatensis)*	Stem / Leaf	Dried	July	Yellow	x				
15. HYBRIDBARLIND / Anglojap Yew / *Taxus x media*	Stem / Bark	Fresh	June	Apricot / Brown	x				
16. HØSTBERBERIS / Japanese Barberry / *Berberis thunbergii* / green leaves	Stem / Leaf	Fresh	July	Yellow / Grey	x				
– / red leaves	Stem / Leaf	Fresh	July	Apricot / Yellow	x				
17. JAPAN PESTROT / Sweet Coltsfoot, Butterbur / *Petasites japonicus*	Leaf	–	–	Yellow / Orange					
18. KANADAGULLRIS / (Giant-)Goldenrod / *Solidago canadensis (+ gigantea serotina)*	Flowering stem	–	–	Yellow / Green/ Grey	x				
19. KJEMPESPRINGFRØ / Himalayan Balsam / *Impatiens glandulifera*	Stem/ Leaf/ Flower	–	–	Ginger/ Brown					
20. KLASESPIREA / Meadowsweets / *Spiraea ×billardii*	Twig	Fresh	July	Rose	x				
21. KLISTERSVINEBLOM / Sticky Groundsel / *Senecio viscosus*	Leaf	–	–	Green					
	Flower	–	–	Yellow / Brown					
22. KRYPFREDLØS / Creeping Jenny / *Lysimachia nummularia*	Root	Fresh	Sept	Brown / Grey	x				
	Leaf / Stem	Fresh	Sept	Yellow / Beige / Grey	x				
23. MONGOLSPRINGFRØ / Smallflower Touchmenot / *Impatiens parviflora*	Leaf / Stem	–	–	Yellow					
24. PARKGULLTVETANN / Yellow Archangel / *Lamiastrum galeobdolon galeobdolon*	Leaf / Stem	–	–	Green / Beige					
25. PARKSLIREKNE / Japanese Knotweed / *Reynoutria japonica, Fallopia japonica*	Leaf	Fresh	May	Yellow / Ochre / Grey	x				
(HYBRIDSLIREKNE, Bohemian Knotweed / *Reynoutria x bohemica)*	Root	Fresh	July	Yellow / Orange Red / Green	x				
26. PLATANLØNN / Sycamore / *Acer pseudoplatanus*	Bark / Twig	Fresh	June	Beige	x				
	Leaf	Fresh	June	Yellow	x				
27. PRAKTMARIKÅPE / Lady's-mantle / *Alchemilla mollis*	Leaf / Stem	Fresh	May	Yellow / Green	x				
28. PURPURSPIREA SPIREA (Bjarkøyspirea) / Meadowsweets / *Spiraea x rosalba*	Twig	Fresh	July	Rose	x				
29. RYNKEROSE / Beach Rose / *Rosa rugosa*	Hip	Dried	July	Beige	x				
	Petal	Dried	June	Beige / Brown	x				
30. RØDHYLL / Red Elderberry / *Sambucus racemosa*	Berry	Dried	August	Beige / Green	x				
31. SKOGSKJEGG/ Goat's Beard / *Aruncus dioicus*	Leaf / Stem	Fresh	June	Yellow / Green	x				
32.SNØBÆRBUSK/ Common Snowberry /*Symphoricarpos albus (L.) S.F.Blake*	Twig	Fresh	June	Yellow / Grey	x				
33. SITKAGRAN (+Lutzgran) / Sitka Spruce/ *Picea sitchensis (+Picea xlutzii)*	Needle / Twig	Fresh	June	Beige / Brown	x				
34. TROMSØPALME / (Persian) Hogweed / *Heracleum persicum, Heracleum tromsoensis*	Leaf / Stem	Fresh	June	Yellow / Grey	x				
35. VESTAMERIKANSK HEMLOKK / Western Hemlock / *Tsuga heterophylla*	Bark	Fresh	May	Brown	x				
36. VALURT / Comfrey / *Symphytum officinale*	Leaf / Stem	–	–	Green					
37. ULLBORRE / Woolly Burdock / *Arctium tomentosum*	Root	–	–	Green / Beige					

NOTES

1 Proceedings of the XVII Color Conference: A. Siniscalco (2022), *Colour and Colorimetry. Multidisciplinary Contributions.* Vol. XVII A, Gruppo del Colore - Associazione Italiana Colore, https://doi.org/10.23738/RCASB.006

2 Myrvoll, B. (n.d.). *Bent Erik Myrvoll.* Retrieved May 21, 2024, from http://www.bentmyrvoll.com

3 Zecchi. (n.d.). *Zecchi - Colors and Equipment for Fine Arts*. Retrieved May 21, 2024, from http://www.zecchi.it

4 Blaafarveværket. (n.d.). *Koboltgruvene.* Retrieved May 16, 2024, from https://blaa.no/en/koboltgruvene/?fbclid=IwAR0w4HsJnu7zGxP2dV4QC-mj_VSNthcBSBFVxAOnQHNYMWCsMHJshoBb-Ic

5 The Norwegian Crafts Institute [Handverksinstituttet] (n.d.). *Bent Erik Myrvoll - Kalkmaler.* Retrieved from https://handverksinstituttet.no/stipendiater/tidligere-stipendiater/bent-erik-myrvoll-kalkmaler

6 The case was covered by NRK when the first burning started: https://www.nrk.no/mr/pa-afarnes-i-rauma-brennes-stillehavsosters-som-senere-skal-bli-til-kunst-1.16174229

7 The “Oyster Dugnad”: https://www.vestfoldfylke.no/no/ostersdugnaden/

8 Lukešová, H., Palau, A. S. & Holst, B. (2017).*Identifying plant fibre textiles from Norwegian Merovingian Period and Viking Age graves: The Late Iron Age Collection of the University Museum of Bergen.* Journal of Archaeological Science: Reports, 13, 281-285. https://doi.org/https://doi.org/10.1016/j.jasrep.2017.03.051

9 Bender, L. & Walton, P. (1986). *Dyes and Fleece Types in Prehistoric Textiles from Scandinavia and Germany. Journal of Danish Archaeology*, 5, 177-188. https://doi.org/https://doi.org/10.1080/0108464X.1986.10589966

10 Bechtold, T., Turcanu, A., Ganglberger, E. & Geissler, S. (2003). *Natural dyes in modern textile dyehouses — how to combine experiences of two centuries to meet the demands of the future?* Journal of Cleaner Production, 11(5), 499-509. https://doi.org/https://doi.org/10.1016/S0959-6526(02)00077-X

11 Christensen, H. (1924). *Lærebok i farvning med planter.* Cappelen. https://doi.org/oai:nb.bibsys.no:990118325254702202 URN:NBN:no-nb_digibok_2021041348603

12 Artsorakelet [The Species Oracle] is an app from the Norwegian Biodiversity Information Centre that provides you with the name of the plant (animal or fungus) you have photographed. It is a great help for “plant-nubies”, like me, who need some support in identifying the right plant. Artsdatabanken. (n.d.). *Artsorakelet*. Retrieved from https://orakel.artsdatabanken.no

13 Wilhelmsen, S. E. (2022). *Plants out of place? A design-driven investigation of colour and material possibilities within a group of “invasive alien plant species” in a Norwegian context.* In A. Siniscalco (Ed.), Colour and Colorimetry. Multidisciplinary Contributions.(Vol. Vol. XVII A). Gruppo del Colore - Associazione Italiana Colore. https://doi.org/https://doi.org/10.23738/RCASB.006, ISBN 978-88-99513-18-4

14 Logan, J. (2018). *Make Ink - A Forager’s Guide to Natural Inkmaking*. Abrams

Fibrous Futures

The sub-study *Fibrous Futures* has been accomplished as a series of practical experiments, as well as mapping and reflections on various types of fibre and related crafts and techniques. The aim has been to grow a broader understanding of historical precedents, and fibre quality in the significant plant group, enabling a more comprehensive assessment of future possibilities. The study has yielded a diverse array of techniques and illustrative examples. In dialogue with one of the only active rope makers in the world, Sarah Sjøgreen, we have delved into discussions surrounding the value, historical significance, and prospective trajectories of traditional material-based craftsmanship. The chapter concludes with an outlining of potential design-led processes and actions for long-term planning.

A Fibre Overview

A survey of historical, present, and possible future fibre use has served to understand the extent of plant fibre diversity. Throughout history, plant fibres have served a multitude of purposes, depending on available resources, climatic conditions, cultural practices, and technological advancements. Generally, the purposes can be understood as applications for textiles and clothing, lines, ropes, and cordage, papermaking, building materials, basket making and braided objects, composite materials, 3D printing, nutrition, medicinal and herbal traditions. Some of these aspects are beyond the scope of a material-based study, such as fibres for nutrition or medicine. Others are material-based, yet excluded due to their demands on thorough material research beyond the fibre. These are techniques such as 3D printing and the incorporation of composite materials, which are dependent on matrix materials, often a polymer, resin-like epoxy or polyester, to create materials with good mechanical properties.

Yet, whether a plant is suitable for paper, wickerwork, cordage, or textiles is usually a good indicator that the same plants will be suitable for further processing towards 3D printing or composite materials. These applications require plant fibre with strength, length, flexibility, and processability. To focus on the core properties of the plants, I have therefore limited the study to the aspects of textiles and clothing, lines, ropes, cordage, papermaking, building materials, basket making and braided objects. Through insight into key points of technical and material understanding, I envision the emergence of a contemporary and situated appreciation of these plant fibres, as natural and regenerative local materials.

Learning from the Past when Planning for the Future

As the saying goes, "Necessity is the mother of invention." Keeping warm, swaddling a child, shrouding the deceased, or wrapping one's

belongings have been fundamental needs for humans throughout history. In these situations, humans have turned to fibres from plants or animals, whether braided, woven, or spun, to provide aid. The making of textiles from plants has historically relied on a diverse range of raw plant materials, in contrast to the current emphasis on a few sources, in particular cotton. In Scandinavia, local plant fibres like flax, hemp, hop, and nettle have been well-known and used[1],[2]. Today the need for plant fibre mostly relies on imported goods, putting significant pressure on the global cotton market[3]. Furthermore, the anticipated effects of climate change on global cotton production are rooted in the fact that cotton plants require specific temperature and moisture conditions to produce fibres of adequate quantity and quality[4]. This could render it an unreliable source for future production. Compared to Scandinavia the utilisation of plant fibre for textile production has a more extensive tradition in other parts of the world[5]. History can indeed serve as a source of knowledge, inspiration, and examples of living off local resources. We can glean valuable lessons from past societies as we strategise for the sustainable management of tomorrow's plant fibres. The necessity today is not the acute need of more goods, but the urgency of the climate crisis[6], that prompts new ways of consuming and producing.

In the article: *Is It Hop? Identifying Hop Fibres in a European Historical Context*, the researchers describe how hop fibres have been used as a filling material, fibre for ropes, textiles and paper, but since it is difficult to distinguish hop from other bast fibres in historical findings, the actual extent of its use may still be rather underestimated[7]. In the article, they propose that use of hop has been developed as a result of utilising the remains from beer production. I see this as a clear illustration of a local plant that almost incidentally evolved into a plant for fibre production.

Another historical clue is found in the article: *Identifying plant fibre textiles from Norwegian Merovingian Period and Viking Age graves*, from The Late Iron Age Collection of the University Museum of Bergen[8]. Here textile investigations from Viking graves are described. These are based on various fabric samples, which give an insight into the textiles of the (wealthy) Vikings. The similarity between hemp and linen is mentioned here, and how the use of these two can be explained based on material availability and local traditions. For me, this imply that flax has been primarily cultivated due to its excellent adaptation to local climatic conditions, making it suitable and dependable for cultivation in Norway. Again availability, climate, cultural practices, and technological advancements are key drivers. These are very interesting perspectives. Can unconventional plant fibres be used to develop or deepen the understanding of natural plant fibres for textiles - once again?

A third refence on historical practices and traditional knowledge, is not related to Norwegian landscapes, but still offers valuable historical and philosophical input. *Braiding Sweetgrass* by Robin Wall Kimmerer gives insights into the interconnectedness of nature, indigenous wisdom, and sustainable living practices[9]. Through storytelling and scientific inquiry, Kimmerer explores the reciprocal relationship between humans and the natural world, emphasizing the importance of gratitude and stewardship. She bases the book on her own efforts to understand and (re-)connect to the stories and traditional knowledge passed down by her ancestors, the Potawatomi, a Native American people of the Great Plains; the region of western Great Lakes and upper Mississippi River. Kimmerer demonstrates how a personal journey can be relevant not only for other individuals, but also in order to trigger a discussion on a community- and system level. The book left me with the two words: frugality and gratitude.

By understanding more about how past societies adapted to their environments by making use of local resources efficiently, I have derived valuable insights for addressing contemporary environmental challenges. In the following conversation with Sarah Sjøgreen, we discuss historical practices that can inspire future innovative solutions.

Conversation with Sarah Sjøgreen

Sarah Sjøgreen is one of the only active rope

makers in the world. She works at the Hardanger Maritime Centre, which is considered the Nordic region's largest professional community for the restoration of historic vessels. The centre has an 80-metre-long ropewalk, in addition to a smithy, a slipway, and its own small boat workshop[10]. This is the only place with rope making expertise in Norway, which makes Sarah a key resource and spokesperson for an almost-extinct profession. Today, rope is mostly produced industrially from synthetic materials, which has changed the way we use and relate to these products. I wanted to talk to Sarah about the value of keeping historical crafts alive, about plant-based fibre, and the culture surrounding a craft or semi-manual production, that makes it flourish, disappear or return. This may have transfer value to other fibres, and other fibre-related techniques, through the utilization of IAPS. Our conversation took place at the Hardanger Maritime Centre in Norheimsund, Norway.

Siren Elise Wilhelmsen: I see the rope maker as a constant, and almost as a witness and a messenger from another time, where knowledge of craftsmanship, quality, and infrastructure was mainly rooted locally. Making rope is said to be one of the earliest crafts we know of, and the oldest evidence of this activity is 35,000 years old[11]. It puts things into perspective. What does it mean to you to be a representative of a historic craft? Do you feel a responsibility to keep this knowledge alive?
Sarah Sjøgreen: Yes, there is an antiquarian aspect to this job, which really is about keeping the craft alive. And in this respect, we rely very much on the Norwegian Directorate for Cultural Heritage, which enables the development of related projects. In crafts you must use your hands. You have to get to know the fibres, which have personalities and characteristics. They react differently to dry and humid air, storage and use. There are many factors with which you must gain experience to understand the scope.

What is also interesting from a historical perspective is the development of the rope making profession itself. We have many traces and evidence of handicrafts, but we do not know exactly when and how the so called "medieval technique" was introduced. There is a gap in the story. It went from being non-existent to being a full-scale industry.

Another aspect is that which is dependent on the individual. As long as I am the only rope maker, my perspective and my way is the *only* way. At the same time, the continuation of the craft depends on me training new rope makers. It takes four years. There are three of us in Norway who have the trade certificate, but I am the only one actively practising the craft. In addition, we have found a rope maker in the Netherlands and one in France. But otherwise, we do not know of anyone else in the world who work with this in the traditional way. In some places, the industry can make hand-spun rope on a ropewalk, but no one holds a full-time position. However, they can produce this type of quality for large orders. In Norway, emphasis is placed on maintaining the craftsmanship. We are the only country that educates students in the rope making profession. And I'm educating my own heir. Production does not cover its own costs, so it will probably be difficult to engage two people. At some point, I will have to abdicate the throne, and let the new generation take over – unless we gain a larger customer base.

SW: Is it possible to specialise in slightly different directions, and expand the repertoire, rather than competing?
SS: The woman who held this position before me was probably more oriented towards the craftsmanship aspect, with different fibres and techniques. So, it is possible to focus on different areas, yes. I came to the rope making profession through my interest in sailing. A lot of ropewalks have been built right by a harbour, because this is where most of the customers for this rope quality have been located. But my Dutch colleague is an inland rope maker. There has been a lot of rope in use beyond the maritime, with less requirement for strength. However, these fibres are often regarded as «second grade» although they in fact are of good quality. There are many uses for rope in agriculture, such as hinges and tying animals, fencing, as strapping materials, and in structures and tools. In addition, there are a whole range of other applications for ropes, such as in building and construction, sports and leisure, crafts, or

product manufacturing. There is a wide variety of ropes for different industries and situations, but- because of the price, hand-spun rope will not be relevant in all these areas.

SW: What is a typical order you receive as a rope maker?
SS: Most of all, we produce and sell tarred hemp for traditional vessels. Additionally, we get a lot of custom orders. Some of these may be a bit unusual and a little outside our typical scope of work. When I say we, it's because I have an apprentice here now, so there are two of us working together. And that's a good thing, since much of what comes in is not just about making rope by the metre, but about using broader knowledge on how to make all kinds of rope.

SW: What tasks are involved?
SS: For example, we are now going to make two special ropes for a bride and groom, who want to tie a "love knot" out of a rope made of linden bast and one made of horsehair. We also receive requests to make rope from special fibres or to make products from rope, like mats. Strictly speaking that´s out of our expertise, but we usually do it anyway. Others want to get hold of old rope and are surprised that I only sell new rope! In addition, the job consists of rigging work on boats and related vessels, as well as research, illustration of craft techniques, and sharing our knowledge with others. Often, we also have to build the tools needed to complete a job, since the equipment is simply not available any longer. I often say that I am a traditional craftsman, rather than a rope maker. It becomes so specialised that many people don´t know what it is.

SW: What you just said there is interesting. Because it is a very good description of how the culture has changed. I'm fascinated and interested in the wealth of local materials that have previously been used to create various everyday objects, and believe that rope has always been crucial in so many different situations. The University archives contain a text from 1988, which presents finds of various ropes from excavations at Bryggen, the medieval wharf in Bergen[12]. It describes archaeological finds from the Middle Ages, which show the use of grass, trees and shrubs; shredded pine wood (Pinus Silvestris) and spruce (Picea abies), rope spun from grass stalks and leaves of grass, braided rope made from common haircap (Polytrichum commune). Twisted rope made of heather (Calluna vulgaris) and a wide variety of trees, such as linden (Tilia), willow (Salix sp), hazel (Corylus avellana), oak (Quercus sp), birch (Betula sp), yew (Taxus baccata), ash (Fraxinus excelsior), juniper (Juniperus communis), and beech (Fagus), were clearly in use around this time. The text states that most of these likely originated from local plants. What happened to this wealth of fibres that was used the past?
SS: It's developed gradually, but the biggest change historically is the availability of industrial rope and cordage. Before rope makers began producing, ropes were made on farms, as a handicraft. If a rope was needed, it was made using whatever materials were available in the immediate surroundings. I'm always very careful about saying that they used "this" and "that", because what we're seeing is that people have been very creative. If there was heather nearby, they used it. If hay had to be tied up, then maybe you just used hay. And as you mentioned: linden bast. We know that has been in use for a very, very long time and has a high quality compared to many other ropes from the time. But it is a time-consuming process. Therefore, this quality was only used in the past where it was necessary. Horsehair or animal hides were also good quality and commonly used. As mentioned, shipping has always been the area that has required rope of the highest quality and durability. And leather rope may be similar to what was to come a little later, namely hemp.

SW: Are we now talking about the Middle Ages? Did they import hemp back then?
SS: Well, hemp is an absolutely amazing plant, and it has been used for a lot of different things. We know that it was grown in Norway for several hundred years, but the best hemp was imported from Riga, and the entire Baltic area. The second best came from Italy. It was not until they wanted to boost the sale of plastic that hemp became illegal.

SW: So, what you're saying is that banning hemp

was a political tool and there was a financial interest behind it?
SS: There was at least a political shift in attitude right around the same time that plastic was introduced. I can't say for sure, but it certainly led to hemp being banned and plastic taking over the market. There may have been several reasons, but political and economic interests definitely contributed to the decision[13].

SW: And plastic has really taken over, which has contributed greatly to the environmental challenges we face today. There has been a lot of talk about plastic in the oceans, but not so much about plastic maritime rope. An article from 2021 describes how maritime rope made of plastic contributes billions of microplastic particles to the oceans every year[14]. This study tested different ropes from different eras. Unsurprisingly, what emerged was that microplastics from the rope industry enter the marine environment to an even greater extent than previously thought. What do you think about the role of plastic rope in the marine environment?
SS: Of course, plastic ropes have properties that natural materials cannot compete with. Over time, they have managed to develop so many different qualities and some in very good quality. I use plastic rope for mooring, for example. Because it is simply better suited for that. I don't mean that plastic should necessarily be abolished, but it can and should be greatly reduced. We can look here to natural materials, because, in most areas, they are the ones that have the best qualities overall. It is not always necessary to have a very strong or rot-resistant rope, and in such cases, one can use sisal or flax, to mention a fibre that can be grown here.

SW: Which natural fibres are in use today, and are there any that are grown locally?
SS: We mostly use hemp or cotton. Occasionally, we use manila. However, none of these are available locally. As mentioned, hemp could be grown here. It is cultivated in large parts of Europe, including Sweden and Denmark, but it is still prohibited in Norway.

SW: What effect does it have that your materials originate from imported raw materials?
SS: One thing is the raw materials. It would be nice to have them come from Norway, but our biggest challenge is the infrastructure around further processing. Our raw material is spun yarn, but we don't spin it ourselves. And that intermediary, who does the spinning, is hard to find. We need long fibres for our work, and there are almost no machines that can make it. Most people only make yarn from short fibres. That is where we encounter a major problem. To get the right, long fibres we have had to buy it from China or Egypt. And of course, that's certainly a shame.

SW: So even though the materials could have been grown and processed here, you end up having to order it from China?
SS: Yes, exactly, and that makes access vulnerable and complicated. It takes a lot of time and planning, and then there is a certain risk when you order large quantities from the other side of the world. It is risky both politically, timewise, economically and environmentally.

SW: Do you order materials for several years at a time?
SS: We have to do that to keep production- and shipping costs, and the environmental impact, down. And there is also another reason for ordering from China: there are not many other countries that are willing to change their entire production to satisfy the customer. But they do it there. And the item we get is a special order. But it is not unproblematic, and we have to cope with the fact that the goods are produced under working conditions that we would not approve of here.

SW: And yet it's hemp you want to use? Are there other natural materials available?
SS. I divide the materials into two groups, based on before and after the introduction of the ropewalk. Before, as we talked about, there was a large group of various fibres in use. These were linden bast, horsehair, and leather, as well as various plant fibres, which were processed as handicrafts at home in the village. Even though some people travelled around and gathered leather for rope, and although there was a kind of system around exactly that, it was not an

industry. But after the ropewalks came, these became workplaces and area of expertise. From then on, there were also a few materials that were preferable to use. These were hemp, manila, and coconut.

SW: What was the difference in the qualities of these three fibres?
SS: What's special about hemp is that it can be tarred. And if you do that, and renew the tar at regular intervals, then you have a rope that can withstand use and salt water for up to 20, and in some cases 30, years. Manila is a banana plant. It is a strong fibre and a much cheaper material than hemp. But it does not absorb tar, and its service life is therefore reduced to about five years. Coconut fibres are short and weaker in strength but are very light and elastic. It is important to note that weaker strength does not equate to lower quality. Each material has its own properties and use and they cannot really be compared. These materials were established across countries and continents, as the fibres used by rope makers.

SW: How long have you been working as a rope maker?
SS: It's been almost fourteen years.

SW: Global warming and climate change have put natural materials in a new light in recent years. During your years in the industry, have you noticed any change in interest or awareness among customers?
SS: Our prices are high, but we really feel that people are becoming more environmentally conscious and want to avoid plastic to a greater extent. In addition, people have become a little more concerned with good quality. Most people are not particularly interested in craftsmanship, which is for enthusiasts. From time to time, we are invited into projects dealing with history, culture, or the possibility of future facilitation of plant-based fibre use. We then contribute by thinking practically about how the mentality can be changed, but also how things can be solved technically. But it often ends there, because when it comes to the nitty gritty, there are several challenges with this. The main challenge is often the cost of developing a new machine park. And in the case of tar hemp for individuals, although there is an interest, it will be a considerable investment. Not all private individuals can keep up financially.

SW: We have also become accustomed to cheap products and have developed a lifestyle adapted to a high level of consumption. I think that as long as cheap goods are available, it is challenging to introduce products that represent a different mindset. But still, it is crucial that the alternatives exist and are being further developed.
SS: Yes, there is an entire mentality that needs to change. What I see is that longevity and good quality are what persuade people to invest in hand-spun rope. With hemp, it's affordable, after all. But if I were to sell linden bast ropes, for example, it would be a completely different matter. It would not have been possible to pay, because the processing is so laborious, in combination with the fact that the material is nowhere near as durable. Today, you need to first grow a linden forest, before felling the trees many years later, then peel off the bark, soak the fibre for many weeks, leave it to dry, before processing it again. So, there's a reason why they stopped doing it! And the same thing with horsehair. It's a whole science just to get hold of the material. It's no longer possible to buy horsehair from a butcher, because they are actually required to burn the hair, in addition to the fact that demand for horse meat has decreased, and there are fewer horses being slaughtered. Therefore, it must be cut at the owner's house, and preferably before the animal is put down. But it is also problematic to take the tails of live animals due to animal welfare concerns. It would also be very cumbersome to go via the various farmers. So, again the alternative is to order from China or Mongolia, where animal welfare is not as big of an issue. But it would still be problematic for us. My experience is that if a change in attitude is to be possible, we need to introduce competitive, high-quality products, and we need to have control over the associated infrastructure ourselves.

SW: Do you have any visions for the future of your craft? And is there anything we can learn from the society of the past when planning for the future?

SS: To use an example from the reconstruction of the Viking ships Draken Harald Hårfagre and Saga Oseberg, to which we have contributed rope: They chose to go with tarred hemp, even though it is probably historically inaccurate, since the Vikings primarily used skin ropes, horsehair, and linden bast. It is somewhat limited what can be said with certainty about history, but that is the general assumption. As I mentioned earlier: ropes made from animal hides and hair are complicated due to animal welfare and the associated systems, and the production of linden ropes has a long process. In addition, they need to be replaced continuously. Since there are so few who have the knowledge to be able to operate such a production, it is not feasible today. And tar hemp is also a much stronger and more durable material. So, my vision for the future is that we can achieve a change in legislation regarding the production of hemp in Norway, and that hemp can have a larger place in the market again. We now have a long ropewalk in Kristiansund[15], and that means a lot. In addition, we have our own tar plant here in Hardanger. This, step by step, helps us to maintain the old techniques, and give them new life and value in today's society.

Sarah Sjøgreen has approved the final version of the interview, which has been edited for clarity.

Hands-on Experiments

Fibrous Futures refers to the development of new local sustainable fibres that reduce the environmental impact of various industries. My conversation with Sarah Sjøgreen sheds light on the role of traditional craftsmanship and the use of materials. In her view, history seems to have taken a detour through the development and refinement of plastic, only to return to the starting point after an era of industrialisation. As she points out, throughout history, various local fibres have had different uses. For single-use and short-lived purposes, easily made and "no-preparation" fibres have been utilised. For long-lasting and strong fibres, more complex preparations and production methods have been employed. In our era, plastic has been a cheap and available resource, used for both single-use and long-term purposes, although the material's lifespan has not matched its use.

To consider long-term material strategies, it has therefore been interesting to study the different qualities and potential applications of the IAPS fibres.

In this study I´ve been collecting information and conducting hands-on experiments, based on skills and insight developed through several workshops and co-learning situations mainly focusing on basic, traditional knowledge about basket weaving techniques, papermaking and fibre extraction in order to test the fibres of the IAPS.

Yarn, rope and cordage

To learn the basics of making plant-based yarn, rope, and cordage, I have attended courses on processing plant material. As Sarah Sjøgreen says; there are many different approaches and materials possible. As a newbie, my learning curve has been steep, and my missteps many. However, through failures and errors, the study has discovered key insights and new directions for future in-dept research.

Wickerwork

Wickerwork is the weaving of pliable materials such as willow, rattan, reed, or bamboo to make furniture, baskets and decorative objects. The materials used in wickerwork are chosen for their flexibility and strength, making them suitable for weaving into sturdy, yet lightweight structures. Basket-making is a form of wickerwork, and one of the oldest crafts known to humanity, with evidence of basketry dating back thousands of years in various cultures worldwide[16]. Different cultures have developed unique styles and techniques of basket-making, reflecting their resources, traditions, and needs; from the use of willow in European traditions, sweetgrass by Native American tribes, to bamboo that has been widely used in Asian cultures[17],[18]. In this study, I have mainly experimented with the IAPS Scotch broom (*Cytisus scoparius*), Red osier dogwood (*Cornus sericea*) and Japanese knotweed (*Fallopia/ Reynoutria japonica*) for basket making, where the two first mentioned clearly demonstrate why they have already had cultural significance as a material for basket weaving. The knotweed shows qualities for a more delicate use. As Sarah expressed: every

fibre has its own qualities, it is our task to find the application.

Papermaking

Based on my PhD topic, I was invited to join a collaborative project called *PlanteLiv* [*PlantLife*], an initiative led by associate professor of botany and researcher Heidi Lie Andersen and paper artist Elly Prestegård. Together, we formed a diverse group of creatives and botanists, working to make paper from plants found in the botanical garden at Milde, Bergen. This collaboration marked the beginning of my journey into learning about papermaking processes and qualities. It also initiated my exploration of papermaking as a collective and educational activity.

Over the past year, I have assisted in two papermaking workshops at KMD with Assistant Professor Käte-Elin Madsen. The first workshop included Radha Pandey and Johan Solberg from Halden Bookworks, and the second was a new collaboration with Elly Prestegård. Understanding material preparation and plant selection is crucial for papermaking. However, once the preparations are completed, the actual process is a delightful activity that can engage both professionals and amateurs. Paper is a remarkable material that has become so commonplace we often take it for granted. Yet, by making our own sheets, we gain a deeper appreciation for its unique variations and diversity. Papermaking elegantly balances between 2D and 3D, material and object, authenticity and expression, continuity and stability, as both solitary and collaborative work. It can also be a botanical journey, as different plants yield different sheets, varying in texture, colour, flexibility and thickness.

These co-learning activities, along with the guidelines and recipes from *Papermaking with Garden Plants & Common Weeds* by Helen Hiebert[19], have helped develop my understanding and knowledge of plant fibre preparation, various processing methods, and approaches to formation and finishing. What I find especially interesting about this process is the variety of techniques and qualities it involves. This opens many possibilities for discovering different structures, functions, shapes, and colours.

Textile

Papermaking is closely related to textile making, with several overlapping processes. First, the preparation of fibres is similar in both crafts. Once the fibres are prepared, they can either be spun into yarn or mixed into a paper pulp. In Japan, a unique craft known as Shifu has been developed. Shifu is a cloth woven with paper thread, either in the warp, the weft, or both. The Japanese have known about paper since the 3rd or 4th century, and it is believed that by the 6th century, they were already making paper by hand, spinning paper thread, and weaving Shifu[20]. Their material for making the paper probably came from wild kozo. In modern times, paper yarn has become a recycling strategy, where recycled paper is spun into yarn and reused for textile-products[21].

While shifu and paper yarn is a further development of a paper product, also the viscose process is related. It starts by breaking down raw plant materials into cellulose fibres through mechanical or chemical processes. The cellulose fibres are dissolved in a chemical solution to create a viscous pulp, which is then extruded through spinnerets to form fibres. These fibres are stretched, washed, and spun into yarns. This method relies on mechanized and chemical processes. Concerns about harmful chemicals have led to more sustainable developments in recent decades, such as those implemented by the Finnish manufacturer Spinnova[22].

A third method of creating yarn and textiles from raw plant material is the traditional technique. This includes hand carding, hand spinning, and using simple tools like spindles and spinning wheels. Traditional methods typically have a lower environmental impact due to their natural processes and lack of industrialization, but they are labour-intensive. In this project, the textile-making with the IAPS remains a theoretical possibility. Although I have practised making yarn, my skills are not yet sufficient for making the amount needed to produce a textile.

Innovation prospect

Lenzing AG, an Austrian company, specializes in producing cellulose fibres for the textile and nonwovens industries. Known for their sustainable production and innovative fibres like TENCEL™,

Lenzing Modal™, and Lenzing Viscose™[23], I approached them to test Japanese knotweed fibres in an industrial process. This led to an exchange and visit to their factory, establishing a new collaboration with a small-scale technical lab in Germany specializing in Plant and Wood Chemistry. Together, we applied for innovation funding. Although the initial funding was not granted, the collaboration is set to continue post-PhD.

Design-related Sustainability Strategies

This sub study has been examining the fibre stories represented by the IAPS. Through co-learning and studio experiments, I have gained a deeper understanding of materials, and through conversations, historical, and theoretical references, I have circled in on possible measures and strategies for a long-term perspective. In the following sections, my attempt is to elaborate on the systemic long-term thinking regarding possible coexistence and sustainable utilization of the plants as (fibre-)materials.

When considering the IAPS as new local materials, a first concern has been the current handling of them (as described in the text *Nomen est Omen*). Could the system that manages these plants today be a part of tomorrow's strategy? Should it be a non-profit initiative? Should it be community-driven? And maybe supported by the municipality? Or rather driven by local entrepreneurs and industry? It is not in the scope of the research to develop this kind of plan, but it is an aim to explore alternatives for possible transitional strategies. The goal is to look at strategies to move away from traditional resource extraction, aiming to achieve long-term sustainability by addressing environmental, economic, and social challenges in an integrated manner. This requires systemic changes in how materials are sourced, processed, and integrated into production systems. There are existing frameworks that are relevant when developing a transitional design approach. I will mention a few, to look at their distinct focuses and overlapping approaches. This is to understand how they could be important for the long-term thinking of IAPS as local resources and future significant plants. As made clear in the text *Design (in) Context,* the project is contextualised within a Transition Design agenda. This framework builds, in large, on the Living Systems Theory[24], which I want to highlight. Yet, first, I want to mention some intersecting design-related sustainability strategies, place them in the context and demonstrate how the Living Systems Theory can serve as an overarching framework that encompasses these principles.

The Cradle to Cradle framework, focuses on creating products that are safe and beneficial for both humans and the environment throughout their entire lifecycle. It emphasizes designing for disassembly and recycling[25]. It promotes the idea that all materials should either biodegrade safely or be perpetually reused in a closed-loop system. With this it aligns with both the concept of Circular Economy[26] and Zero Waste[27].

Circular Economy is promoting the shift from a linear "take-make-dispose" model to a circular one, that involves significant changes in how materials are sourced, used, and disposed of. Similar to Circular Economy's approach to repurposing waste materials and creating closed-loop systems, Zero Waste is focusing on minimizing waste generation and maximizing resource efficiency by redesigning life cycles of products so that all materials are reused. The ultimate goal is to ensure that nothing is sent to landfills, incinerators, or the ocean.

Also, the already mentioned philosophy of Biomimicry[28] aligns with these principles, as it sees nature as a source for learning. As practiced by the MIT media Lab and Neri Oxman, it involves following nature's designs and processes to solve human problems sustainably, and pursues biomimicry as a technology of nature, which promotes the creation of systems that are in harmony with the natural world.

Regenerative Design[29] is relevant in this context, as this approach to design is aiming beyond sustainability in order to restore, renew, or revitalize sources of energy and materials. It focuses on systems that have a positive impact on the environment. These values build, in large, on Permaculture principles.

Permaculture is not a design-specific framework, but an approach towards a fundamental shift in agricultural and ecological

practices, emphasizing sustainability, biodiversity, and resilience[30]. It promotes ecosystem restoration and sustainable resource management. Permaculture principles initially focused on sustainable agriculture and gardening, but has since expanded to encompass broader aspects of sustainable living and community design. And here I come back to the Living Systems Theory, which, like Permaculture, has a focus on interconnectivity, self-organization, feedback, resource efficiency, diversity, and adaptability, but in contrast is a more a more theoretical and scientific approach. It was developed by James Grier Miller in 1978, in the field of systems science, and aims to understand the complex interactions and behaviours of living systems at various scales, from cells to ecosystems to human societies[31].

Where Permaculture emphasizes actionable guidelines and practices that individuals and communities can implement, including specific techniques for sustainable farming, water management, and energy use[32], Living Systems Theory provides a conceptual understanding of system dynamics and interactions. It offers insights that can inform practices but does not prescribe specific actions or techniques. Permaculture is typically applied at a smaller scale, such as individual properties, community gardens, and small farms. It focuses on tangible, localized solutions. Living Systems Theory is applicable at various scales, from microscopic biological systems to large-scale ecosystems and human societies. It provides a framework for understanding complex interactions across different levels of organization. Permaculture and Living Systems Theory share a holistic and systems-based approach to sustainability, but differ in their origins, scope, focus, and application. Both principles are relevant to this project; however, the following approach to outlining and imagining a long-term plan is based on the Living Systems Theory as interpreted in Transitional Design.

Outlining and Imagining Potential Future Plans for IAPS as Living Systems

Systems theories generally include definitions, assumptions, and propositions related to reality as an integrated hierarchy of organizations of matter and energy. Of all complex systems, Living Systems Theory centres around the living ones, how they "work," maintain, develop and change. By definition, living systems are open and self-organizing, and have the special characteristics of life and ecological interaction with their environment[33]. It can be as simple as a single cell or as complex as a universal organization. Regardless of their complexity, they all depend upon the same essential processes to survive and to continue the propagation. Some processes deal with material and energy for the metabolic processes of the system. Others with information for coordination, guidance and control of the system. Some are concerned with both. In the conference document *Living systems theory and its relevance to design* Terry Irwin highlights how the theory relates to design-processes.

With this as a starting point, I have outlined actions for a slow and empathic process towards the long-term inclusion of IAPS as locally and culturally significant plants and resources. The integration of open systems and approaches on a grassroot and community-based level, is a strategy to build awareness, and look for "signs of emergence". Focusing on relationships at multiple levels, rather than on physical artifacts, helps study the dynamics of the system. Irwin: "Small changes in behaviour and the introduction of new ideas, information and practices within complex social systems can ramify throughout the system to create sweeping powerful change on either a physical or psychological level"[34].

1. Initial Assessment and Research

Identify plants: Conducting a thorough survey to identify relevant IAPS in the local landscape.
Research fibre properties: Studying the physical and chemical properties of fibres from these plants to determine suitability for various applications.

2. Sustainable Harvesting and Management

Controlled harvesting: Developing guidelines for sustainable harvesting to prevent further spread and ensure ecological balance.
Integration with ecosystem restoration: Linking harvesting efforts with local ecosystem restoration

projects to improve biodiversity and habitat quality.

3. Community-Led Initiatives
Skill development & Knowledge sharing: Organizing workshops to train community members in sustainable harvesting, fibre processing, and product manufacturing using IAPS fibres. Facilitating knowledge exchange sessions for experts and locals to share insights on sustainable practices and innovative uses of these fibres.
Cooperatives: Establishing cooperatives to manage the harvesting, processing, and selling of IAPS-based products. This ensures community ownership and a just distribution of benefits.
Local Markets: Promoting local markets for IAPS-based products, supporting local economies and reducing carbon footprints associated with long-distance transportation.

4. Education and Awareness Programs
School Programs: Integrating IAPS-based projects into school curriculums to educate the younger generation in sustainability and regenerative practices.
Public Campaigns: Conducting awareness campaigns to inform the public about the environmental benefits of using IAPS fibres.
Research Partnerships: Partner with universities and research institutions to study the properties and potential uses of IAPS fibres, and to develop innovative processing techniques.
NGO Support: Collaborate with environmental NGOs to promote sustainable practices and provide resources for community projects.

5. Policy Advocacy and Support
Incentives: Advocate for government incentives for businesses and communities that engage in sustainable practices using IAPS fibres, and support the use of IAPS in material production, including incentives for businesses and regulations promoting sustainable practices
Regulations: Support the creation of regulations that promote the sustainable use of IAPS and penalize practices that harm the environment. Establish industry standards and certification processes to ensure the quality and sustainability of IAPS-based products.

6. Cultural Integration
Art and Design Projects: Encourage artists and designers to use IAPS fibres in their work, raising awareness and showcasing the potential of these materials in creative and practical applications.
Cultural Events: Organize festivals and exhibitions that celebrate sustainable practices and highlight the use of IAPS fibres in various cultural expressions.

7. Pilot Projects
Launch Pilot Initiatives: Start with small-scale pilot projects in selected communities to test and refine the approaches. Gather data and feedback to improve the processes.
Document Success Stories: Create case studies from pilot projects to showcase successful implementations and inspire broader adoption.

8. Scaling Up
Expand Reach: Gradually scaling up successful projects to include more communities and regions.
Resource Allocation: Secure funding and resources from governmental and non-governmental organizations to support the expansion.

9. Monitoring and Evaluation
Continuous Assessment: Implement regular monitoring and evaluation to assess the effectiveness of the strategies and make necessary adjustments.
Community Feedback: Maintain open channels for community feedback to ensure that the initiatives remain relevant and beneficial.

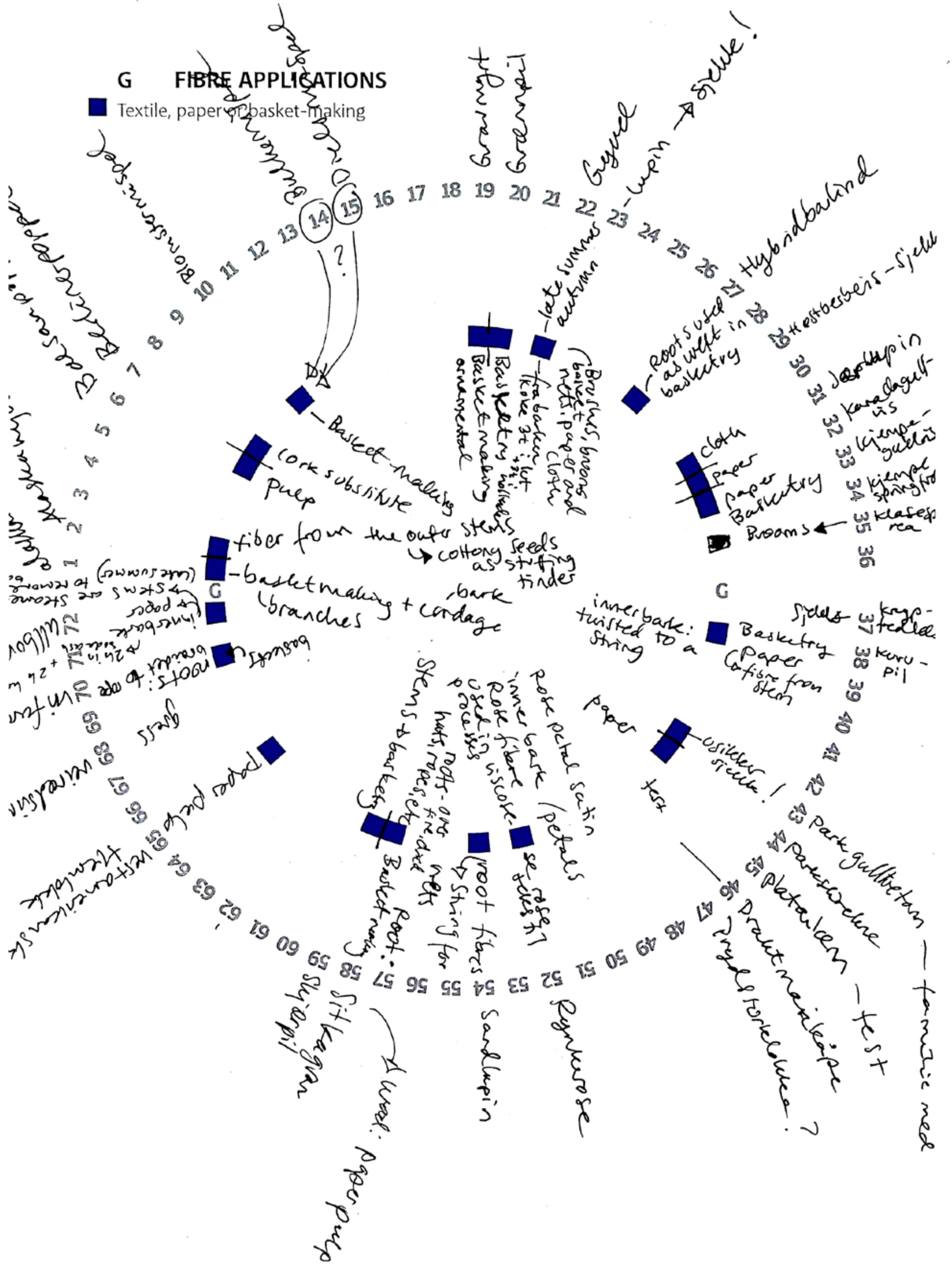
Planning for an open, non-linear, and complex living system brings me back to the rhizomes and their ability to sense and strive for emerging potentials. These plans should be viewed as the start of a network of slowly developing root shoots that, with proper nutrition and care, can grow into strong and robust stems. By integrating community-based activities, governmental incentives and societal approaches, the strategy is to build a resilient, sustainable, and regenerative material culture that leverages the potential of IAPS fibres, promotes local economies, and

enhances environmental stewardship. This can be adopted into entrepreneurship, traditions, and new approaches to goods, materials and resources. This strategy has been carried forward into the conceptual map *New Ground*, which is described in the chapter under the same name.

Project Activities related to *Fibrous Futures*:
2024 Co-Learning: *Basket making with living Willow*, Drude Isene, Botanical Garden Milde, Bergen
2024 Co-Learning: *Ocean-Mats from Hemp*, Hardanger Maritime Centre, Norheimsund
2024 Co-Learning: *Paper Workshop,* Elly Prestegård, KMD Bergen
2023 Application for Innovation Grant, *UiB Ide* (to the final round), with the Technical University Dresden
2023 Co-Learning: *Paper workshop*, Halden bookworkshop, KMD Bergen
2023 Presentation and Conference: *Textile Intersections*, Conference, Loughborough University London
2023 Presentation, Seminar and Workshop: *Matters of Activity*, Humbold Universität Berlin
2022 Fieldtrips: Lenzing / Haslach / Vienna, Meetings
2021 Co-Learning: *Stinging Nettle Yarn*, by Drabantbybruket, Landås Food Forest
2019 Collaboration and Workshop: *PlanteLiv-Making Paper of local Plants*, Botanical Garden Milde
2019 Open Workshop during Gjenbruksuken [Recycling Week] : *Make a Christmas wreath from the invasive West American Hemlock*, City of Bergen, Bir, Friends of the Earth
2019 Co-Learning: *Which fibres are you wearing today?* Kristina Bjureke, Botanical Garden Oslo
2019 Co-Learning: *Basket making with Willow*, Drude Isene (2 days), Sjøtunet i Hardanger
2019 Co-Learning: *Spinning wool*, Ullveka [Wool Week] , Lyngheisenteret

G FIBRE APPLICATIONS

■ Textile, paper or basket-making



1. ALASKAKORNELL / Red-osier dogwood / *Swida sericea* — Branches: Basket-making / Bark: cordage
2. ALASKAMJØLKE / Fringed Willowherb / *Epilobium ciliatum glandulosum* — Outer stems: fiber / Cottony seeds: stuffing

Wood fibre: Pulp
6. BALSAMPOPPEL / Balsam Poplar, Black cottonwood / *Populus balsamifera* — Wood: Cork substitute
7. BERLINERPOPPEL / Berlin poplar / *Populus × berolinensis*

10. BLOMSTERMISPEL / Showy Cotoneaster / Many-flowered Cotoneaster / *Cotoneaster multiflorus* — Branches: Basket-making

19. GRAVMYRT / Lesser Periwinkle, Common Periwink / *Vinca minor* — Stems: ornamental basket-making
20. GRØNNPIL/ crack willow, brittle willow/ *Salix × fragilis (Salix × rubens)* — Branches: Basketry

22. GYVEL / Scotch broom / *Cytisus scoparius* — Bark: paper / Branches: basketry, brooms, brushes, nets, cloth

27. HYBRIDBARLIND / Anglojap yew / *Taxus x media* — Root: werft in basketry

31. JÆRLUPIN / Sundial Lupine / *Lupinus perennis* — Stems: cloth
32. KANADAGULLRIS / Goldenrod / *Solidago canadensis* — Stems: paper
33. KJEMPEGULLRIS / Tall goldenrod, giant goldenrod / *Solidago gigantea serotina* — Stems: paper, basketry

35. Klasespirea — Branches: Brooms
37. Krypfredløs — Stems: ?
38. KURVPIL / Basket willow / *Salix viminalis* — Branches: Basketry / Stems: paper / Innerbark: twisted to a string

43. PARKGULLTVETANN / Yellow archangel, artillery plant, aluminium plant / *Lamiastrum galeobdolon galeobdolon* — ?
44. PARKSLIREKNE (Kjempeslirekne + Hybridslirekne) / Japanese knotweed / *Reynoutria japonica* — Innerbark. paper
45. Platanlønn — Bark

52. RYNKEROSE / Beach rose, Japanese rose / *Rosa rugosa* — Petals: rose petal yarn / Stem: bast fibers

54. SANDLUPIN / Blue Lupine, Nootka lupine / *Lupinus nootkatensis* — Root: string for nets

58. SITKAGRAN (+Lutzgran) / Sitka Spruce/ *Picea sitchensis (+Picea ×lutzii)* — Branches: paper pulp, basketry / Root: rope
59. SKJØRPIL / Bullata / *Salix euxina* — Stems: basketry

65. VESTAMERIKANSK HEMLOKK / Western hemlock (-spruce) / *Tsuga heterophylla* — Wood: paperpulp

70. VRIFURU / Lodgepole pine, shore pine, twisted pine / *Pinus contorta*
Root: braided to rope , baskets
72. ULLBORRE / Woolly burdock, downy burdock/ *Arctium tomentosum* — Innerbark: paper

Observations

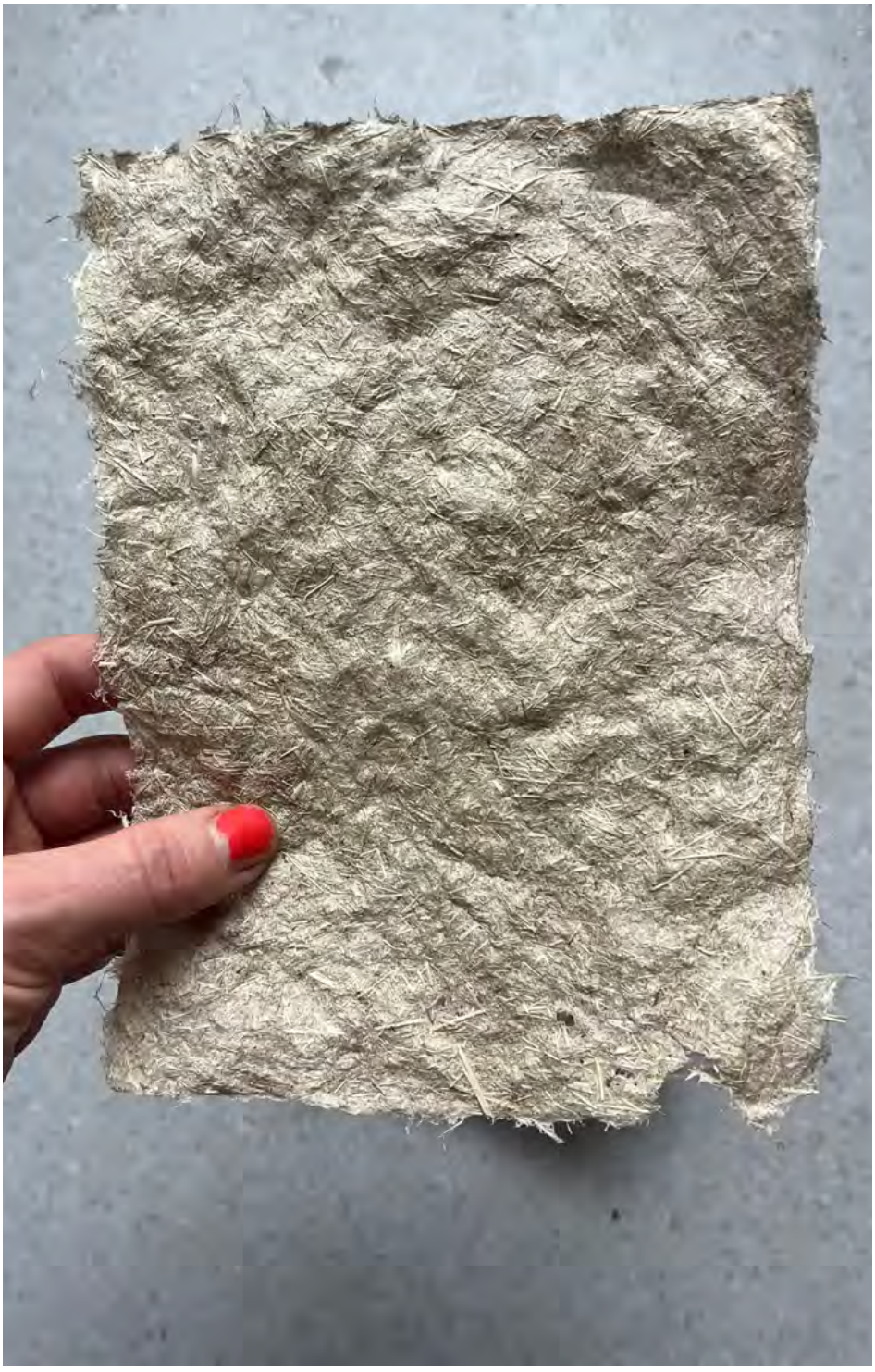
Fibre experimentations

Collaboration:
PlanteLiv [Plant Life]
Workshop Group.
Papermaking with plants
from the Botanical
Garden, Milde. 2020

Papermaking with
students and Halden
Bookworks at KMD, 2023

Knotweed paper experiments (2019-20)

Knotweed paper (2023)



Lupine paper (2023)

NOTES

1 Skoglund, G. Holst, B. Lukesova, H. (2020). *First experimental evidence of hop fibres in historical textiles. Archaeological and Anthropological Sciences.* Retrieved from https://doi.org/10.1007/s12520-020-01171-6

2 Bergfjord, C., Mannering, U., Frei, K. M., Gleba, M., Scharff, A. B., Skals, I., Heinemeier, J., Nosch, M.-L., & Holst, B. (2012). *Nettle as a distinct Bronze Age textile plant. Scientific Reports,* 2(664). Retrieved from https://doi.org/10.1038/srep00664

3 Voora, V., Bermúdez, S., Larrea, C., Farrell, J., Luna, E. (2022). *Cotton prices and sustainability. Global Market Report.* IISD. Retrieved from https://www.iisd.org/system/files/2023-01/2023-global-market-report-cotton.pdf)

4 Hughes, K. (2021). *Climate change - Impacts and mitigation in the cotton sector. Bremen Cotton Exchange.* Retrieved from https://neu.baumwollboerse.de/en/2021/06/22/climate-change-impacts-and-mitigation-in-the-cotton-sector/

5 Karimah, A., Ridho, M. R., Munawar, S. S., Ismadi, Amin, Y., Damayanti, R., Lubis, M. A. R., et al. (2021). *A Comprehensive Review on Natural Fibers: Technological and Socio-Economical Aspects. Polymers,* 13(24), 4280. MDPI AG. Retrieved from http://dx.doi.org/10.3390/polym13244280

6 UNEP. (2021). *Making Peace with Nature: A scientific blueprint to tackle the climate, biodiversity and pollution emergencies.* (978-92-807-3837-7). Nairobi: United Nations Environment Programme Retrieved from https://www.unep.org/resources/making-peace-nature

7 Lukesova, H., Andersen, H. L., Kolínová, M., & Holst, B. (2018). *Is It Hop? Identifying Hop Fibres in a European Historical Context. Archaeometry,* 61(2). DOI: 10.1111/arcm.12437

8 Lukešová, H., Palau, A. S., & Holst, B. (2017). *Identifying plant fibre textiles from Norwegian Merovingian Period and Viking Age graves: The Late Iron Age Collection of the University Museum of Bergen. Journal of Archaeological Science: Reports,* 13, 281-285. https://doi.org/10.1016/j.jasrep.2017.03.051

9 Kimmerer, R. W. (2013). *Braiding sweetgrass: Indigenous wisdom, scientific knowledge, and the teachings of plants.* Milkweed Editions.

10 The Hardanger Maritime Centre in Norheimsund: www.fartoyvern.no

11 A new article describes the production of rope made about 35,000 years ago. Here, use a tool made of mammoth ivory from the Hohle Fels cave in Germany as a basis to reconstruct the way people from the early Palaeolithic period produced rope:
Conard, N. J., & Rots, V. (2024). *Rope making in the Aurignacian of Central Europe more than 35,000 years ago.* Science Advances, 10(5), eadh5217. https://doi.org/10.1126/sciadv.adh5217

12 Schjølberg, E. (1988). *Cordage and Similar Products from Bryggen in Bergen.* In The Bryggen Papers, Supplementary Series 3. Norwegian University Press. (pp. 126, 134). ISBN 8200077292. Retrieved from https://www.nb.no/items/URN:NBN:no-nb_digibok_2015120306008?page=109

13 This book explores the history and use of hemp and argues that its criminalisation was motivated in part by financial interests: Herer, J. (2000). *The Emperor Wears No Clothes.* Quick American Archives.

14 Napper, I. E., Wright, L. S., Barrett, A. C., Parker-Jurd, F. N. F., & Thompson, R. C. (2022). *Potential microplastic release from the maritime industry: Abrasion of rope.* Science of the Total Environment, 804, 150155. https://doi.org/10.1016/j.scitotenv.2021.150155.

15 The Norwegian Cultural Heritage Fund has long worked to save Brunsviken's ropewalk in Kristiansund. This is the last ropewalk in Norway where the original production equipment remains intact. The facility is a technical-industrial cultural monument from 1856. You can read about the project on the Norwegian Cultural Heritage Fund's website: https://kulturminnefondet.no/prosjekt/reperbane/
And on NRK's website:
Stenberg, M. A. J. (2024, January 2). *Nye tider for ein gammal slager*. NRK. https://www.nrk.

no/mr/reipslagar-sarah-sjogreen-lagar-tau-pa-den-restaurerte-reiperbana-i-brunsvika-kristians-und-1.16693237,retrieved 03.05.24

16 Wendrich, W., & Ryan, P. (2012). *Phytoliths and basketry materials at Çatalhöyük (Turkey): Timelines of growth, harvest and objects life histories*. Paléorient, 38(1-2), 55-63. https://doi.org/10.3406/paleo.2012.5458

17 Bichard, M. (2008). Baskets in Europe. Fyfield Wick Editions. ISBN-10: 0956024904. ISBN-13: 978-0956024909

18 Doble, R. (2021). *The Crucial Importance of Basket Weaving Technology for the World's First Civilizations.* https://doi.org/10.13140/RG.2.2.10400.51203

19 Hiebert, H. (2006). *Papermaking with garden plants & common weeds.* Storey Publishing. g

20 Karuno, Hiroko, "Shifu: A Traditional Paper Textile of Japan" (2016). Textile Society of America Symposium Proceedings. 977.
http://digitalcommons.unl.edu/tsaconf/977

21 Memon, H., Hu, D., Wu, L., Wang, Y., Yao, J., Militky, J., Kremenakova, D., & Zhu, G. (2024). *Structure, properties, and fabric applicability of sustainable paper yarn with high washing stability.* Heliyon, 10(5), e27467. https://doi.org/10.1016/j.heliyon.2024.e27467

22 Spinnova is a new textile startup, who makes viscose-fibre using a technology that is said to save 90% of the water-use, as well as cutting the chemicals.
Circular Bioeconomy, Innovations. (2020, January 24). *The Finnish startup Spinnova is transforming the textile industry without burdening the environment: "You can even eat our fibres".* Forest.fi. Retrieved from https://forest.fi/
Drumm, S. (2021, November 11). *Inside Spinnova's future textiles factory, where trees are turned into clothing.* Sifted. Retrieved from https://sifted.eu/articles/spinnova-wood-pulp-fibre-fashion
Spinnova. (n.d.). Spinnova. Retrieved May 15, 2024, from https://spinnova.com

23 Lenzing AG. (n.d.). *Lenzing*. Retrieved May 16, 2024, from https://www.lenzing.com

24 Miller, J. G. (1978). *Living Systems.* McGraw-Hill.

25 Braungart, M., & McDonough, W. (2002). C*radle to cradle: Remaking the way we make things*. North Point Press.
Also: https://c2ccertified.org

26 Geissdoerfer, M., Savaget, P., Bocken, N. M. P., & Hultink, E. J. (2017). *The Circular Economy - A new sustainability paradigm?. Journal of Cleaner Production*, 143, 757-768. https://doi.org/10.1016/j.jclepro.2016.12.048

27 Zero Waste is a philosophy and strategy aimed at minimizing waste generation and maximizing resource efficiency by redesigning life cycles of products so that all materials are reused. The ultimate goal is to ensure that nothing is sent to landfills, incinerators, or the ocean.

28 Oxman, N. (2016). *Material ecology.* MIT Media Lab. Retrieved from https://www.media.mit.edu. Biomimicry Institute. (n.d.). Retrieved from https://biomimicry.org

29 Regenerative design goes beyond sustainability to restore, renew, or revitalize their own sources of energy and materials. It focuses on systems that have a net positive impact on the environment.
Regenesis Group. (n.d.). *Regenesis: Regenerative development and design.* Retrieved from https://regenesisgroup.com

30 Permakultur in Norway: https://www.permakultur.no
Permaculture internationally: https://www.permaculturenews.org

31 Miller, J.G. (1978)

32 Holmgren, D. (2002). *Permaculture: Principles and Pathways Beyond Sustainability.*

33 Irwin, T. (2011). *Living systems theory and its relevance to design: A matrix.* Developed for the 2011 AIGA Conference, Phoenix. Retrieved from https://www.academia.edu/6076107/Living_Systems_Theory_Relevance_to_Design

34 (Irwin, 2011)

New Ground

This chapter provides an overview over the artistic results, titled *New Ground*, and the final exhibition, *Odd New Spring,* presented at the University Museum in Bergen, The Natural History Collections' Tårnsalen [the Tower Hall]. I will share reflections on key insights from the process, then elaborate on contributions and future prospects, and end with some concluding thoughts.

Artistic Results

The project has challenged the prevailing approach of treating Invasive Alien Plant Species (IAPS) as problematic strangers and instead intended to unlock the potential of the "new flora" as a basis on which a novel local material culture can develop. By studying and mapping the origins of the plants and their stories, as well as investigating their individual and collective properties, I have been able to speculate and envision alternative futures of coexistence. Through the four sub-studies, specific aspects, methods, and practical investigations have been targeted, and have linked the artistic research to new sub-themes and different communities:

(1) *Nomen Est Omen* – creating a new narrative
(2) *Interpreting Fallopia Japonica* – portraying individuality (and belonging)
(3) *Colours of the Forbidden Garden* – presenting diversity.
(4) *Fibrous futures* – thinking long-term for new material cultures.

The project has, like a rhizome, built a vast network of interconnected topics, knowledge, skills, questions, reflections, junctions and materialisations. This has culminated in a *New Ground* for navigating and collectively reimagining future scenarios and defining a new design position. The *New Ground* is defined by theoretical insights, practical experiments, questions and dialogues, speculations and reflections. It is the result of cross-disciplinary exchange and contribution – facilitated, mediated, and implemented through the artistic practice.

The *New Ground* is built up by four main elements, through which methods and tools for transition and new modes of making and coexisting are represented. These are (numbers refer to the sub-studies listed above): a series of (four) conversations (1,2,3,4), a series of (seventeen) woven textiles (1), experimental material proposals (2,3,4) and a conceptual map for orienting on the *New Ground* (1,2,3,4).

• A series of (four) conversations (1,2,3,4)

> Printed Catalogue: A4, conversations (full version, only edited for clarity), Norwegian/ English language

Role in the *New Ground*:

The conversations with Vigdis Vandvik, Benedicte Brun, Bent Erik Myrvoll and Sarah Sjøgreen sum up important topics, reflections and questions from the project. The dialogues are a tribute to and a testimony of interdisciplinary learning, which has been decisive for the project. Its role in the *New Ground* is to demonstrate and symbolise the importance of `future making´ as a collective activity, developing across disciplines.

• A Series of (seventeen) woven Textiles (1)
> 14 Flags: 90 x 120 cm (woven double-faced, 100% wool)
> 1 Joint portrait: 90 x 120 cm (woven, 100% wool)
> 1 List of Names: 90 x 120 cm (woven, 100% wool)
> 1 Matrix: 120 x 180 cm (woven, 100% wool)

Role in the *New Ground*:

The Matrix serves as a crucial nexus in the project rhizome, this infographic represents the complex system of information, knowledge, and stories that have formed the foundation for new narratives, studio work, experimentation, and interdisciplinary dialogues. It is a tapestry of information. The flags act as storytellers, embodying some of these stories, symbolising identity, belonging, history, values, and hope. They portray fourteen individual plants and are woven as double-sided fabrics: one side shows the plant, while the other reveals an alternative narrative highlighting the plant's positive qualities. A physical shift in perspective is required to discover the new narrative. The choice of material and technique holds significant value, emphasising the importance of these new narratives and their historical and cultural significance as messengers. The process of making a textile can be seen as a way of organizing and interpreting data, much like how data is analysed and presented in the study. This metaphor highlights the importance of considering the relationship between individual data points and how they contribute to the bigger picture.

• Experimental material Proposals (2,3,4)
> A series of food and material studies of Japanese knotweed
> Various textiles and sizes, dyed with pigments derived from Japanese knotweed, Willow, Sitka spruce, Scotch broom, Hemlock, and Lupine.
> A series of objects showcasing different states of raw plant materials: paper objects made from the fibres of Lupine, Japanese knotweed, and Scotch broom, along with bent and intertwined shapes crafted from Scotch broom and Sitka spruce, and the raw fibre from Lupine.
> A series of preliminary investigations and material experiments (both successful and unsuccessful).

Role in the *New Ground*:

The material experiments aim to outline a range of possibilities for engaging with the plants—from basic activities like drawing or pressing plants, to refining and processing them into advanced forms and stable materials. Throughout the project, working with plants as materials for design has been a crucial and steep learning process. The examples demonstrate that both designers and plants have significant potential for development in this context.

• A Conceptual Map for orienting on the *New Ground* (1,2,3,4)
> Map, 100 x 130 cm
> Role in the *New Ground*:

The map aims to provide an overview of the complexity of the systems and elements entangled in the context of developing new design-led practices and interventions. Conceptually, it seeks to look ahead and imagine layers of collaboration and information.

Public Presentation

The artistic results are publicly showcased through the exhibition *Odd New Spring* in the Tower Hall, at The University Museum in Bergen, Natural History Collections. The University Museum represents an ideal setting for the project's diverse audiences and objectives, as it provides a space for both imparting knowledge and sparking wonder. Science, artistic practice, and the public meet in this room, which was originally built as a gallery for the Museum's art collection. Here, all parts of the project are presented together for the first time.

The Exhibition

In my final exhibition, I aim to showcase the diversity of interventions, innovations, and collaborations that the project highlights as possibilities for the near future. The exhibition spans two floors. The first floor features the woven textiles, the four conversations, a digital photo display of my Grandparents house and garden, the conceptual map *New Ground* and Experimental material proposals based on (3) *Colours of the Forbidden Garden* and (4) *Fibrous futures* and a neon sign, that highlights the urban and man-made situation of the *Odd New Spring*. On the second floor we see a range of different approaches, including experimental material proposals based on (2) *Interpreting Fallopia Japonica*, along with a range of studies and investigations from the entire project. This section showcases various stages and qualities of material samples and possibilities for local initiatives.

The exhibition balances between conforming to the strict frameworks of the space (and, by extension, of science) and breaking away to infiltrate these frameworks with new perspectives. It is structured around the flags, which fill the empty space in the middle of the hall and position themselves with authority in the solemn space that radiates the atmosphere of an academic ceremonial room, as to demonstrate their belonging in the context. The messages the Matrix and the flags convey and the knowledge they carry is discussed, reflected upon, and interacted with through the other exhibits.
All of these materialise fragments of the same foundation and collectively represent the essence

of the *Odd New Spring*.

The Museum Context

The public presentation is placed at the very heart of scientific research and history, in the University Museum. The project exists at the intersection of the artistic and the scientific—the imaginative, intuitive, and the formal knowledge. On the one hand the project is grounded in science and theory, while on the other it represents an interpretation and a curiosity about the connections that emerge when different fields are connected. *Odd New Spring* is part of an academic discussion, but at the same time it represents a counterpoint to the established positions. The project aims to open up discussions about how we relate to our current landscapes, represented by the IAPS, and what possibilities arise if we choose to take a new perspective. Both in expression and message, the exhibition stands out in the museum, while drawing its power and inspiration from the same source as the rest: from nature.

Production of Knowledge

Through the artistic results and the exhibition, the artistic expressions offer new ways of understanding, interpreting and providing insights and perspectives that may not be conveyed through traditional academic or scientific means. The plants carry stories from different places and times, which in the work weave together the past and future, creating a canvas for reflecting on connections and relationships in the present.

Odd New Spring invites the audience to engage beyond merely observing the physical objects, encouraging a new kind of interaction with the plants and landscapes. The artistic results challenge established preconceptions about IAPS and the designer's role, and their potential roles in society. I view the production of knowledge as a means of this social commentary and addressing of contemporary urgencies, exploring the cultural, social and political contexts in which they occur.

The New Design Position

With a particular focus on the local landscape and flora, networks, and future prospects, both my repositioning as a transition designer and the IAPS´ repositioning as the "new flora" affirm our new status through the presentation in the museum. As a new branch within the broad PhD tradition, artistic research can, through the power of interpretation and imagination, take on different perspectives on topics that otherwise belong in various academic silos. Here, I find that design can take a unique position, serving as a bridge between scientific, artistic and societal angles. One of the main discoveries through *Odd New Spring* has been the importance of interdisciplinarity and the designer as a glue, a bridge, or an architect of that rhizome that needs to be constructed between the elements. Transition designers can join perspectives, knowledge, and considerations across different fields. My project has demonstrated this in various ways, including how knowledge about different aspects of material culture, both past and present, relies on collaboration to develop and become established in society. Transition designers can engage with stakeholders interested in either production or learning, contributing to both commercial and community-based dissemination and development platforms. Together, we can develop skills and knowledge about how plants and their materials work, how they can be applied, and how ecosystems can be supported through our interaction and care. Transition designers can facilitate these processes and effectively communicate the message. In a rhizomatic map, the transition designer actively draws new lines and helps nourish the growth of new plant shoots. This is what I have aimed to demonstrate through the exhibition, its setting, and the way in which the results are presented. Through the new design position, the aim is not about creating a single new object but about fostering new processes.

Notes on Time: Obstacles, Changes and Challenges

Time and seasons

I want to share some notes on changes and challenges I have met through this process. A significant part of the project involved both learning and teaching, participating in various constellations and contexts to collectively explore a topic, while other parts of it was about solitary work in the field and in the studio. At times,

these processes coexisted harmoniously, while at other times, seasonal tasks were challenged by concurrent courses, seminars, travels, or other activities. This challenge became even more evident during the pandemic, as important work during the spring and summer seasons was interrupted. While the pandemic's challenges were not unique, they prompted my realisation of the fundamental differences in working with living, raw materials compared to processed materials purchased from a shop. Harvesting from nature can be straightforward if you know what, when, and where to look and have the opportunity to act when the time is right. However, there is much to learn and plan to be able to harvest the correct plant at the appropriate time for consumption, medicinal use, plant dye, or fibre usage. With seasons changing rapidly, failing to pay attention or lacking time during the designated time slot means waiting another year for the next opportunity!

Unlearning and New Practices

Odd New Spring engages on many levels with topics that are rather new to me: artistic research, teaching, writing, plants, making materials, using craft techniques, decoding systems, as well as new theories and design methods. It has been exciting and necessary, but it has also taken a significant amount of time to learn enough to integrate the information and skill sets into the project and determine their meaning to me and their role in the larger context. I initiated several experiments relying on my "design intuition," only to encounter failures due to technical details. Why isn't the colour sticking to the fabric? Why does the paper break? It took countless trials, courses, and tests over several years before I could include any of these techniques in my repertoire. I learned the hard way that things take time and must be studied from – literally – the root. However, through this process, I unintentionally learned something else of great value: I realised that these long processes were part of a method of unlearning certain spinal reflexes and practising completely new ones. In the research project I have started the design process from a different point compared to before, which has opened for engaging with topics in new ways. This requires working on different scales. On a micro-scale, I learned the details about the plants, understood when and how to collect them for different uses, and learned how the various materials work and behave. On a macro scale, I recognised the plants as a part of the landscape, societal structures and systems, as well as ecosystems and dynamics. For me, this process has been about integrating into a new, local system, developing an entirely new way of relating to the landscape and interacting with it as a practising designer. This reskilling journey has been a process "from learning to envisioning."

Risk-taking

With this project, I have ventured into very unfamiliar terrain and have sometimes felt like the entire endeavour was one big experiment. If the sub-studies were mountains I've climbed in this new landscape, the climb was itself challenging, but the view from the top was rewarding. Each peak provided me with a new tool and increased my motivation. For me to take this kind of risk would not have been possible without the PhD programme.

Changes

The PhD project was initially titled: *The Settlers: Domestic Exotics. Collecting, investigating, discussing and creating objects, applications and rituals based on the surplus of raw plant material represented through the group of alien, invasive species*. However, around the mid-way evaluation, the project was undergoing changes, and I was reformulating both the research question(s) and the project description to better describe my intentions. The new title *Odd New Spring: Towards Evolving Landscapes and a Reorientation in Design Practice* addresses both the transformed anthropocentric world, Gaia 2.0, and the (new) designer's role. The landscape can be interpreted both as a physical space and as a mental, conceptual, landscape or map, as reflected in the methods and artistic outcomes.

Contributions and Future Prospects

My previous design practice has engaged with material culture through traditional industrial design, as well as through works with a critical and discursive purpose. Common to these approaches

has been an interest in our everyday surroundings and how the objects we create can inspire new ways of living, thinking, or acting. Through artistic research, my perspective, methods and tools have changed. Although I still have the same interest and approach to engage in our everyday surroundings, the position from which I act is new. For me, artistic research, with its reflective focus and approach, has been a pathway to methodological awareness and interdisciplinarity. Through the fellowship program, the project has been able to connect with a large research community while also being a part of the KMD environment, and thereby of the University of Bergen. This awareness has become increasingly important, as the University, with its many faculties and institutes, covers a great deal of the newest – and still open, flexible, searching, and unfinished – thinking in our society. It offers an ideal setting for cooperation and exchange. The more I have developed my understanding and position as an artistic researcher, the more comfortable I have felt engaging in interdisciplinary exchange. By interpreting, challenging, and contributing, I see my subjects and methods becoming integrated into a broader collective process of exploration, creation and reimagining. This is a working mode that I will continue to cultivate in the future.

Although a significant share of the project has been about my relationship to design and a reorientation of my practice, I do hope and believe that my experiences and development can be a relevant example to other designers and artistic researchers. The methods and tools I have used are mostly easy to acquire and inexpensive. Most of the time, I have worked with kitchen- or garden utensils, and my bare hands. Only the "Hollander beater" (for making paper pulp) and the digital loom (TC1/ digital jacquard) are tools that require an investment. Although the Hollander beater can be replaced by a kitchen blender for testing. To me, it has been important that the test and experiments are possible for others to take part in, or to extend on. I have excluded development that includes too advanced or too many additional materials, focusing on a direct, basic experience and understanding.

The *New Ground* is in this sense really a mapping of a ground – a beginning – which leaves many possibilities for other actors to engage in and extend on in different directions. The project is also presented on the web page, www.oddnewspring.com, where I will continue to provide access to the work, making it a source of updated insight, sharing experiences and knowledge.

With this, I hope to feed back into the fields and the ongoing discourses that have informed my research, as well as contribute to shed light on the significant and current issues concerning local livelihoods and sustainable everyday lives. I also wish to foster interest and knowledge about the value and relevance of design in interdisciplinary processes and knowledge production, as well as how to drive societal value and change through working with local natural resources.

Conclusion

My early experiences in the 'forbidden garden' and encounters with Japanese knotweed have significantly shaped my career trajectory and research interests. Not only has this plant captivated me with its versatile applications in medicine, food, and dyeing, but its rhizomes have imparted a profound lesson. The flexible and interconnected nature of rhizomes serves as a blueprint for a way of existing in the world. Unlike the dominant linear and hierarchical structures of modern society, the rhizomatic network emphasizes collaboration and interdependence. By recognizing the connectivity of all aspects of existence, we can foster more sustainable and equitable systems for both people and planet. Through this lens, the rhizome becomes a potent metaphor for understanding our interdependence with the world, advocating for a holistic approach to production and consumption, and striving for a collaborative, interconnected, and sustainable future.

By approaching the group of Invasive Alien Plant Species (IAPS) with this mindset, a new narrative can be articulated. The group of IAPS in Norway must be adaptable and robust to thrive in this harsh environment. They do not

require fields, as they often grow in urban areas where native plants cannot survive. This provides an opportunity to activate abandoned and unmanaged areas of the city for material harvesting, combining it with maintenance of vulnerable areas[1].

Harvesting in this way could be time-consuming since it might involve moving from site to site. On the other hand, cultivating crops in a field would involve ploughing, seed bed preparation, and weed control[2]. Furthermore, replacing harmful and labour-intensive measures to combat IAPS with knowledge and care, could result in a natural risk-reduction and balance based on utilisation, local production, and circular economy. Creating new plant-based palettes and site-specific recipes makes it possible to generate dyes, fibres or food from renewable natural sources, as opposed to synthetic goods produced with substances from non-renewable, non-local sources. The process can be a social practice, a local business, or a forager's way of reducing consumption by collecting plant material for personal use. The harvest and preparation of materials from local plants connects us to them, as well as to the environments and landscapes in which they grow. It is also a way of reconnecting with the past and traditions passed on from artisans through history, while also paving the way towards a balanced and fertile coexistence for the future[3].

The project suggests the transitional designer as a promoter, developer and connecter of new material culture. Tying bonds with the "new flora" has been a method of "landing" in the landscape and accomplish new relationships with both human and non-humans living here.


New Ground
a conceptual map
Methodologies & Approaches
Ecological Stewardship
Innovative systems
A transition towards new material cultures with the New Flora as a basis for change
Related elements and concepts
Design interventions
odd new spring

New Ground
Conceptual map, 2024

Flag, 2024
Photo: Janja Maidl

Flag, 2024
Photo: Janja Maidl

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Plant Matrix


odd new spring

Experimental material proposals

Experimental material proposals

Odd New Spring
University Museum, Bergen

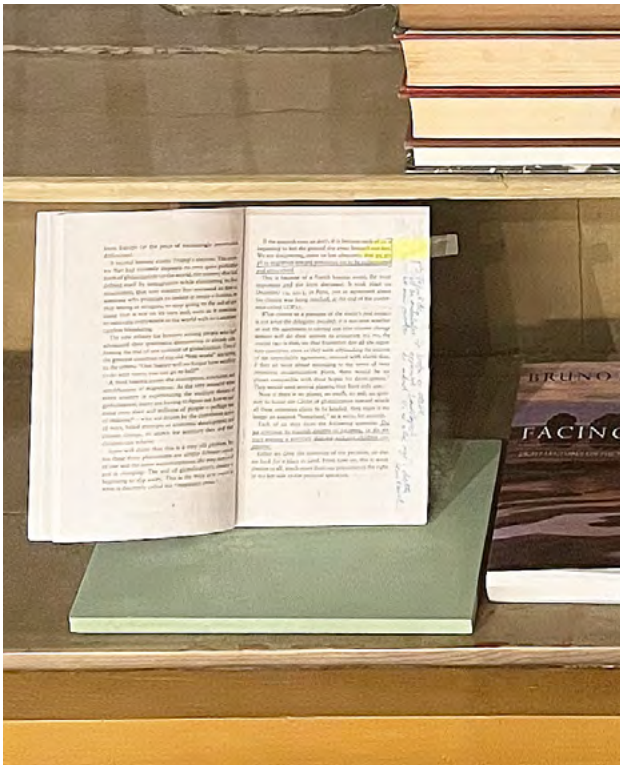
Odd New Spring, opening
University Museum, Bergen
Photo: Eli Kristine Økland

Photo: Eli Kristine Økland

Odd New Spring, Impressions
University Museum, Bergen

Odd New Spring, Impressions
University Museum, Bergen


FIRE SAMTALER
FOUR
CONVERSATIONS


BRUNO


stalking the wild asparagus

Odd New Spring, Impressions
University Museum, Bergen

NOTES

1 Orion, T. (2015). *Beyond the war on invasive species. A permaculture approach to ecosystem restoration*. Chelsea Green Publishing.

2 Bechtold, T., Turcanu, A., Ganglberger, E. & Geissler, S. (2003). *Natural dyes in modern textile dyehouses — how to combine experiences of two centuries to meet the demands of the future?* Journal of Cleaner Production, 11(5), 499-509. https://doi.org/https://doi.org/10.1016/S0959-6526(02)00077-X

3 This section also occur in my Essay “Fieldnotes from the forbidden Garden”, BioColours, Aalto University Press 2023.

Appendix A

Siren Elise Wilhelmsen (2022)

Plants out of place? A design-driven investigation of colour and material possibilities within a group of "invasive alien plant species" in a Norwegian context.

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Plants out of place? A design-driven investigation of colour and material possibilities within a group of "invasive alien plant species" in a Norwegian context

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Abstract

How do we plan and facilitate the production of goods and services for a growing human population, living on an altered and depleted globe? The climate crisis and biological mass extinction, the global pandemic and the unstable political landscape all indicate an urgent need to re-think production and consumption. Although this may seem like an overwhelmingly complex task, we are witnessing a positive trend towards innovative and visionary thinking across disciplines. Design is a field that bridges industry, crafts and science. Through its functionality, creativity, and storytelling, design has the potential – and responsibility – to be an engine for transformation. Thus, belief in and a drive towards concepts and visions for regenerating, reconnecting and rebuilding has been an essential force and leading perspective from which the PhD project "The Settlers – towards new territories in design" has been conducted.

The Settlers is a practice-led research project that questions attitudes and regulations concerning so-called "Invasive Alien Plant Species" (IAPS). While the term "weed" can be used to describe any plant growing in a place where it is not wanted, IAPS is commonly used to label non-native plants that become overpopulated and adversely impact their new environments, causing economic or ecological damage (Orion, 2015). From this perspective, removal and eradication seem like an obvious solution. Yet could this effort and intervention also cause economic or environmental damage? And what do we lose when we ignore, weaken or destroy these plants?

As a take on this complex situation, The Settlers approaches IAPS as new local plants from which we can learn, and with which we need to establish new relationships, in order to achieve a healthier future coexistence. By seeking and gathering stories regarding their edibility, environmental benefits, health benefits, colourants, fibre and wood applications, a new landscape of knowledge and understanding has emerged. Mapping and sorting this information have created the starting point for practical exploration.

This paper focus on the preliminary results regarding colourants for textile dying represented by the IAPS in Norway. Examples of textile dying with various mordants, and colour-extractions, serve to materialize and validate the collected data, and present the beautiful colour varieties of these plants. There is a particular focus on the results of the Japanese Knotweed, *Fallopia japonica*.

Keywords: Design, Invasive Alien Plant Species, Colour applications, Textile dyeing, Circular Economy, Fallopia japonica.

Introduction

As in most parts of Europe, the knowledge of dyeing with natural pigments has a long history in Norway. Early findings of plant-dyed cloth dates back to the Late Roman Iron Age (Jørgensen and Walton, 1986; Lukešová, 2017). It is assumed that mostly local plants were in use at this time, although the red colorants alizarin and purpurin from Madder, *Rubia tinctorum*, and the blue colourant indigotin from Woad, *Isatis tinctoria*, has been identified in various textile samples (Jørgensen and Walton, 1986; Lukešová, 2017). Woad seeds from 834 A.D. were found at the Viking Age ship burial site at Oseberg (Sagberg, 2017). It has also been proven that local variations of madder-like red dyes have been used, such as Bedstraw, *Galium verum L.*, and Northern

Bedstraw, *Galium boreale L.*, as well as a whole range of local, unidentified, yellow dyestuff (Jørgensen and Walton, 1986). For centuries, natural dyes were the main colourants accessible for textile dyeing, yet with the development of synthetic dyes at the beginning of the twentieth century the interest in and further development of natural dyes stagnated (Bechtold, 2003). In Norway, Hilda Christensen was one of the first to gather and preserve the knowledge of the old dye traditions (Sagberg, 2017). Her textbook *Lærebok i farging med planter* ("Textbook on dyeing with plants") on natural dyeing was published 1908. In it, she presented recipes containing imported dyestuffs, like cochineal, indigo and madder, yet her focus was mainly directed towards local barks, leaves, twigs, herbaceous plants, and lichens, most of which are still viable in the Norwegian flora today. Hundred years of producing synthetic dyes, have had a huge impact on environment and humans. Over the years also the landscape and flora has been drastically transformed and makes the starting point for gathering and harvesting today very different than it was for Hilda and her contemporaries. Visual changes in the landscape, like expanded urban, agricultural and industrialized areas, infrastructure and power masts are evident even at a distance. Others must be experienced, like certain climatic changes, or discovered up close, like the range of new species (UNEP, 2021). Since 1800 more than two-thousand non-native alien plant species have settled in the Norwegian flora (Artsdatabanken, 2018). These are, for better or for worse, an existent part of the living landscape surrounding us. This new point of departure makes the necessity to rethink, restructure and re-establish our relationship with the environment seem apparent.

Although most IAPS in Norway have been introduced as ornamental plants, some have long histories as cultural and useful plants elsewhere (Artsdatabanken, 2018). Plants which are labelled as invasive in one place may be appreciated or protected in another context. Dyer's Woad *Isatis tinctoria,* has for instance been a sought- after resource throughout history. Today is has pest status in some western states of the United States, while in the UK it is being re-introduced as a commercial dyestuff and cultivated as a such (Moore, 2019; The Woad Centre, 2012). Similarly, Japanese Knotweed, *Fallopia japonica*, one of the world's most invasive species, is valued in countries where it has cultural purposes. In Japan and China, it has been used as a traditional medicine for centuries (Shaw, 2013). Its root is a rich source of resveratrol and is sold in nutritional supplements, and its young shoots are consumed as a vegetable (Shaw, 2013).

When the practice-led PhD-project "The Settlers – towards new territories in design" started at the University of Bergen, Faculty of Fine Art, Music and Design in 2018, the first case study and following exhibition, *Interpreting Fallopia japonica* (Fig. 1) presented a design-perspective on Japanese Knotweed, focusing on materials and colours. A range of warm yellows to ochre and golden brown were achieved by boiling its rhizomes without mordants.

Fig. 1 – The Exhibition *Interpreting Fallopia japonica* at Joy Forum in Bergen, April 2019.

At the time, only one research was found on colours and pigments from IAPS, NYC based artist Ellie Irons watercolour project "invasive pigments" (Beans, 2018). But in the following years an increased focus on the topic resulted in interesting studies and projects world-wide. To mention

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some: Alyssa Dennis based in Maryland (US) has started the "Invasive Apothecary", where she works with IAPS as a part of her multidisciplinary art and clinical herbal pharmacy practice (Dennis, 2022), UK-based Marina Belintanis devoted her MA degree to material research on Japanese Knotweed (RCA, 2020), and the city of Ljubljana has made a major investment concerning the handling of IAPS, called the Applause project (Urban innovative action, 2020). Based on the motto: "from harmful to useful", citizen-led activities have approached new circular economic and social systems. From the University of Ljubljana, two papers concerning colour extracts from Japanese Knotweed have been published: *Screen printing with Natural Dye Extract from Japanese Knotweed Rhizome* (Klančnik et al., 2021) and *Cationic Pretreatment of Cotton and Dyeing with Fallopia Japonica Leaves* (Gorjanc et al., 2019). The book, *True colors, world masters of natural dyes and pigments* (Recker, 2020), presents the story of Avani, a community-driven non-profit organization in India. Their mission is to bring back community, local textile production and responsibly made goods. Research on regional dyestuff revealed that a local pest plant, *Agerationa adenophora*, could yield a range of yellow and green dyes (Recker, 2020). Through regular harvesting, thereby removing the plant from the woods, the community helps balance the local ecosystem, which was suffering by the invasion of this plant. At the same time, the community accesses a wild growing dyestuff which is plentiful.
These examples are intriguing indications of a shifting mind-set towards sustainable economic and social systems, based on holistic handling of IAPS as natural resources.

Selection of plant material
The Settlers is focusing the research on the 73 IAPS labelled with the "highest risk assessment" (Artsdatabanken, 2018). Through a mapping of historical and present day usage of colour extraction, descriptions or indications were found regarding more than 60% of the group: 45 plants. This has been the starting point for the following practical colour study. Although the tests were performed as dyes for textile the palette can hopefully be useful for a broader field.
Fig. 2 gives an overview of the 45 plants and their status after the quantitate and qualitative analyses. The studio tests resulted in samples made with 24 plants, selected based on the collected information and availability.

Experimental
Hilda Christensen's textbook *Lærebok i farging med planter* has formed the basis for the recipes and process of making the dye samples. It must be emphasized that these are studio experiments and not lab-tests. Chemical components, lightfastness, wash fastness, and a systematic treatment of each single dyestuff have not been examined. In this early-stage study, the focus has been on outlining the palette.

Plant material – storage and extraction
Although the study was planned for spring/summer 2020, there was a two-year delay due to covid-19. This has affected harvesting and storage as some of the plant material already prepared had to be stored and dried. In addition, the fact that it is not always possible to plan harvesting and processing has caused a variation of fresh and dried processed plant material. This is indicated in Fig. 2. Before extracting the dyestuff, the plant material has been cut into smaller pieces of random sizes. The exception is smaller flowers, like Large-leaved Lupine, *Lupinus polyphyllus,* and Dotted Loosestrife, *Lysimachia punctata*, which have been boiled as they are.

Fibre for testing
Each sample consists of four 60 cm long pieces of 100% pure neutral white wool yarn.

PLANT	PART	CONDITION	TESTED	COLOUR (INDICATION)	ALUMINUM SULFATE	AMMONIUM CHLORIDE	POTASSIUM CARBONATE	IRON(II) SULPHATE	PLAIN VINEGAR
1. ALASKAKORNELL / Red-osier Dogwood / *Swida sericea*	Twig	Fresh	June	Yellow / Grey	x				
2. ALPEASAL / Mougeot's Whitebeam/ *Sorbus mougeotii*	Bark	–	–	Yellow / Brown					
3. ALPEFURU / (buskfuru)/ (Swiss) Mountain Pine / *Pinus mugo*	Needle	–	–	Green					
(VRIFURU / Lodgepole Pine / *Pinus contorta)*	Cone	–	–	Brown					
4. ALPEGULLREGN / Scotch Laburnum / *Laburnum alpinum*	Flower / Leaf	–	–	Yellow					
5. BLEIKSPIREA / Meadowsweets / *Spiraea x rubella*	Twig	Fresh	June	Apricot	x				
6. BLÅHEGG / Juneberry, Serviceberry / *Amelanchier spicata*	Berry	–	–	Purple					
7. BLÅLEDDVED / Fly Honeysuckle/ *Lonicera caerulea (var. Edulis)*	Berry	–	–	Purple					
8. BOERSVINEBLOM / Narrow-leaved Ragwort / *Senecio inaequidens*	Leaf	–	–	Green / Yellow					
	Flower	–	–	Brown / Orange					
9. BULKEMISPEL / Hollyberry Cotoneaster/ *Cotoneaster bullatus*	Leaf	Fresh	May	Beige / Brown	x				
(BLOMSTERMISPEL / Showy Cotoneaster / *Cotoneaster multiflorus)*									
(DIELSMISPEL / Diels' Cotoneaster/ *Cotoneaster dielsianus)*	Root	Fresh	May	Rose	x				
(SPRIKEMISPEL / Spreading Cotoneaster / *Cotoneaster divaricatus)*									
	Berry	–	–	Beige / Rose / Brown	x				
10. FAGERFREDLØS / Dotted Loosestrife / *Lysimachia punctata*	Flower	Fresh	July	Yellow / Green	x				
	Root	Fresh	July	Beige / Brown	x				
11. GRØNNPIL/ Crack Willow / *Salix × fragilis (Salix × rubens)*	Leaf	Fresh	July	Yellow / Green	x				
12. GULLREGN / Laburnum / *Laburnum anagyroides*	Bark	–	–	Brown					
	Flower	–	–	Yellow/ Orange					
13. GYVEL / Scotch Broom / *Cytisus scoparius*	Stem w/ buds	Fresh	April	Green	x				
	Flowering stem	Fresh	July	Green	x				
14. HAGELUPIN / Big-Leaf Lupin, Lupine / *Lupinus polyphyllus*	Blue flowers	Fresh	July	Green/Turquoise	x				
(JÆRLUPIN / Sundial Lupine / *Lupinus perennis)*									
(SANDLUPIN / Blue Lupine / *Lupinus nootkatensis)*	Stem / Leaf	Dried	July	Yellow	x				
15. HYBRIDBARLIND / Anglojap Yew / *Taxus x media*	Stem / Bark	Fresh	June	Apricot / Brown	x				
16. HØSTBERBERIS / Japanese Barberry / *Berberis thunbergii* / green leaves	Stem / Leaf	Fresh	July	Yellow / Grey	x				
– / red leaves	Stem / Leaf	Fresh	July	Apricot / Yellow	x				
17. JAPAN PESTROT / Sweet Coltsfoot, Butterbur / *Petasites japonicus*	Leaf	–	–	Yellow / Orange					
18. KANADAGULLRIS / (Giant-)Goldenrod / *Solidago canadensis (+ gigantea serotina)*	Flowering stem	–	–	Yellow / Green/ Grey	x				
19. KJEMPESPRINGFRØ / Himalayan Balsam / *Impatiens glandulifera*	Stem/ Leaf/ Flower	–	–	Ginger/ Brown					
20. KLASESPIREA / Meadowsweets / *Spiraea ×billardii*	Twig	Fresh	July	Rose	x				
21. KLISTERSVINEBLOM / Sticky Groundsel / *Senecio viscosus*	Leaf	–	–	Green					
	Flower	–	–	Yellow / Brown					
22. KRYPFREDLØS / Creeping Jenny / *Lysimachia nummularia*	Root	Fresh	Sept	Brown / Grey	x				
	Leaf / Stem	Fresh	Sept	Yellow / Beige / Grey	x				
23. MONGOLSPRINGFRØ / Smallflower Touchmenot / *Impatiens parviflora*	Leaf / Stem	–	–	Yellow					
24. PARKGULLTVETANN / Yellow Archangel / *Lamiastrum galeobdolon galeobdolon*	Leaf / Stem	–	–	Green / Beige					
25. PARKSLIREKNE / Japanese Knotweed / *Reynoutria japonica, Fallopia japonica*	Leaf	Fresh	May	Yellow / Ochre / Grey	x				
(HYBRIDSLIREKNE, Bohemian Knotweed / *Reynoutria x bohemica)*	Root	Fresh	July	Yellow / Orange Red / Green	x				
26. PLATANLØNN / Sycamore / *Acer pseudoplatanus*	Bark / Twig	Fresh	June	Beige	x				
	Leaf	Fresh	June	Yellow	x				
27. PRAKTMARIKÅPE / Lady's-mantle / *Alchemilla mollis*	Leaf / Stem	Fresh	May	Yellow / Green	x				
28. PURPURSPIREA SPIREA (Bjarkøyspirea) / Meadowsweets / *Spiraea x rosalba*	Twig	Fresh	July	Rose	x				
29. RYNKEROSE / Beach Rose / *Rosa rugosa*	Hip	Dried	July	Beige	x				
	Petal	Dried	June	Beige / Brown	x				
30. RØDHYLL / Red Elderberry / *Sambucus racemosa*	Berry	Dried	August	Beige / Green	x				
31. SKOGSKJEGG/ Goat's Beard / *Aruncus dioicus*	Leaf / Stem	Fresh	June	Yellow / Green	x				
32.SNØBÆRBUSK/ Common Snowberry /*Symphoricarpos albus (L.) S.F.Blake*	Twig	Fresh	June	Yellow / Grey	x				
33. SITKAGRAN (+Lutzgran) / Sitka Spruce/ *Picea sitchensis (+Picea ×lutzii)*	Needle / Twig	Fresh	June	Beige / Brown	x				
34. TROMSØPALME / (Persian) Hogweed / *Heracleum persicum, Heracleum tromsoensis*	Leaf / Stem	Fresh	June	Yellow / Grey	x				
35. VESTAMERIKANSK HEMLOKK / Western Hemlock / *Tsuga heterophylla*	Bark	Fresh	May	Brown	x				
36. VALURT / Comfrey / *Symphytum officinale*	Leaf / Stem	–	–	Green					
37. ULLBORRE / Woolly Burdock / *Arctium tomentosum*	Root	–	–	Green / Beige					

Fig. 2 – Plant sources, condition of dyestuff, mordants and range of colours. Fibre used for testing is 100% sheep wool, neutral white. Related plants, where the results are expected to be similar, are placed under the same number in this overview. The first name is the plant actually tested.

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Mordants

A broad variation in shade and colour depth has been achieved by applying the natural dyestuffs in various mordants. Alum has been used as a pre-mordant in a separate immersion bath for the fibres, while vinegar, ammonium chloride, iron and pot ash have been used as separate post-mordants.

1. Aluminium Potassium Sulphate, KAl(SO4)2·12H2O. Used to prepare fibres to accept colour. Mixed in a pot with tap water in a ratio of 100g fabric to 5 litres water and 20g Alum.
2. Vinegar, 7% acetic acid by volume. Not a colour shifter, but a fixer. Mixed with hot tap water at a ratio of 1:10 in the rinsing water.
3. Ammonium chloride, NH4CI, is a acidifying salt used as a substitute for previous use of stale urine. Ammonium chloride is added to hot tap water at a ratio 1:5, the fibre has been dipped several times before rinsing in water.
4. Pot ash. Potassium carbonate, K_2CO_3. An alkali mordant used as a colour shifter. The fibre is soaked 10 minutes in hot water of ashes, before being rinsed in water.
5. Iron(II) sulphate, $FeSO_4+7H_2O$. Ratio 4g per 100g fibre. Added the remaining dyebath, fibre boiled in the mixture for 15 minutes before being rinsed in water.

Christensen frequently used tin and copper in her recipes (Christensen, 1943). However, due to their toxic properties, they have been left out of this study. Other mordants she used, like cream of tartar, citric acid or soda will be considered for further development.

Dying

The dyestuff has been extracted with boiling tap water in a pot of stainless steel. The type of plant material varied from stems, twigs, leaves and petals to bark, hips and roots. In order to make working steps that could be applied to all the materials, and with the hope of gaining as clear and strong hues as possible, some safety margins were established regarding dyestuff-fibre ratio and time needed for the dyestuff to be absorbed by the water. These steps have been followed:

1. Dyestuff-fibre ratio: 10g sample fibre to a minimum of 50g dyestuff has been added to 2 litres of water.
2. Time: Dyestuff has been boiled in water and allowed to cool down and soak for 12-24 hours (flowers and soft, thin twigs and stalks were soaked for 12 hours, while hard, dry twigs, bark and roots were soaked for 24 hours) before adding the fibre and heating a second time. The fibre has simmered for 60 minutes before cooling down in the pot, together with the dyestuff.
3. The textile material has been split into 4 parts and treated with the different post-mordants as mentioned above.
4. After rinsing, the swatches were air dried in room temperature.

Results and discussion

This first colour mapping of IAPS in Norway was executed as a part of the PhD project “The Settlers – towards new territories in design” (Wilhelmsen, 2022). It presents the range of colours and hues of 45 different plants. Some plants have not been tested due to availability, others have been tested several times, focusing on different parts of the plant. Through using four different mordants, the study presents a total of 132 swatches, whereof yellows, greens, greys, beiges and browns are frequent examples. Apricot, rose and orange are fewer, while purple is only found twice, and one outcome shows turquoise and one red.

The results represent dyes from roughly 2/3 of the high-risk group and 2% of the total group of IAPS in Norway. But even this small selection shows a rich palette, which outlines a range of possibilities for further elaboration. Some colours stand out with bright and clear shades, like the yellows from Crack Willow, *Salix* × *fragilis* and Goat's beard, *Aruncus dioicus*, the green and turquoise from the Large-leaved Lupine, *Lupinus polyphyllus*, and the rose shades from the Meadowsweets shrub, *Spiraea* × *billardii*. Others are noteworthy due to their variety of shades, like the range of different greens made by Scotch broom, *Cytisus scoparius,* which change from yellow-green tones in April-May towards deeper greens and browns through the season. Iron proves to be a

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strong colour shifter which demands further exploration in order to create a total overview of hues and a scheme for reproducing these. It produces dark browns, greys and greens. Ammonium chloride and ash water are alkaline additives, which tends to create warmer nuances.
Some dyestuffs don't react much on changing the acidity, such as the Sitka Spruce, *Picea sitchensis*, while others, such as the dyestuff extracted from Japanese Knotweed rhizomes, have proved to be pH-sensitive. This dyestuff shows the most remarkable colour shifts in the study. As mentioned, previous tests on Japanese Knotweed, including what is found in research and literature, shows a variety of warm yellows, to ochre and brown hues. Yet, this study has revealed drastic colour shifts on this dyestuff by changing the acidity or alkalinity of the dye baths. Adding iron it turns olive green, and it changes to hues of reds with alkalic agents. A test done without alum-treated fibres shows orange colours occurring with ammonium chloride and rose by using pot ashes. An additional experiment has tested the dyestuff in a 7-day cold-dye. The colours show the same variety, yet in softer and paler tones. Fig. 3 expresses the richness of hues obtained with Japanese Knotweed. As for all samples in this study, further tests are needed to define wash fastness, rub fastness and lightfastness. However, as an indicator the Japanese Knotweed swatches from 2018 have not changed after washing and still demonstrate colour of good, but slightly darker, quality.

Fig. 3 – Japanese-, Giant-, Bohemian Knotweed / Reynoutria (Fallopia) japonica, Reynoutria sachalinensis, Reynoutria x bohemica. Condition of dyestuff, mordants and range of colours. Fibre used for testing is 100% sheep wool, neutral white.

Conclusions

As this deep dive into colours contributes to a larger context and investigation in the PhD project "The Settlers", the results are reflected in light of the opportunities revealed in involvement with the group of IAPS, or the new local flora, in Norway.
Indeed, the IAPS in Norway must be adaptable and robust as they are capable of thriving and successfully reproducing without cultivation in this rough climate and environment extensively changed by humans. They don't require fields, which potentially could be used for food crops, as these plants normally grow where the soil has been disturbed, abandoned or unmanaged. They typically grow in gardens, on green patches between houses, in backyards, along river banks and sidewalks – often in urban areas, where native plants can´t survive the harsh conditions (Orion 2015). Are these plants really "out of place" – and "out of control"? Or are they actually above all 'out of care' and neglected? Interacting with and utilising these landscapes and the plants that inhabit them reveals a possibility to activate abandoned and unmanaged areas of the city (in agreement with the landowner, which often may be the city or state) – and possibly even combining maintenance of vulnerable areas with harvesting material for dyeing, making lake-pigments or other colourants. Harvesting in this way could be time-consuming since it might involve moving from site to site. On the other hand, cultivating dye crops in a field would involve ploughing, seed bed preparation, and weed control (Bechtold and Mussak, 2009). Furthermore, replacing harmful and labour-intensive measures used to combat IAPS with knowledge and care could result in a natural reduction and balance based on utilisation, local production and circular economy.
Creating plant-based palettes, natural dyes, and site-specific recipes make it possible to generate dye from renewable natural sources, as opposed to synthetic dyes produced with substances from

non-renewable sources. The process can be a social practice, a local business or a forager's way of reducing consumption and collecting colourants for personal use. The harvest and preparation of dyestuff from local plants stimulates contemplation and connects us directly to the plants, and the environments and landscapes in which they grow. It is a way to get to know the plants –and to start developing a new relationship and collaboration. It is also a way of reconnecting with the past, with traditions passed on from artisans through history, and a path towards a balanced and fertile coexistence.

The colour study demonstrates that IAPS are promising dye plants for the future. If we overlook these plants, we will miss an opportunity to pair up with plants that can endure and thrive in a changing and demanding climate, securing sustainable local and renewable colourants and materials. What has been found in this study is a range of colours, which can achieve even further varieties. As mentioned, the results should be understood as indicators, more than absolute answers. Seen from a design-perspective, potential future applications include everything from textile dye production and the development of inks, lake-pigments, and food-colorants to the development of new paints for architecture and design, natural stained paper, colourants for cosmetics and pharmaceuticals, and tints for wood treatment.

The aim of this study has been to add new knowledge and insight from involvement with the group of Invasive Alien Plant Species in a Norwegian context, with transfer value to other communities and ecosystems. This can hopefully contribute to widening the range of information available and drawing further attention to the potential of pushing the boundaries of local resources and holistic planning of (any scale of) colour production.

References

Artsdatabanken (2018) Fremmedartslista 2018. https://artsdatabanken.no/fremmedartslista2018

Bechtold, T. et al. (2003) Natural dyes in modern textile dyehouses – how to combine experiences of two centuries to meet the demands of the future? *J Clean Prod*, 11(5), doi.org/10.1016/S0959-6526(02)00077-X

Bechtold, T. and Mussak, R. (2009) *Handbook of Natural Colorants.* West Sussex: John Wiley & Sons Ltd

Beans, C. (2018) *Painting with invasive pigments.* US: Proceedings of the National Academy of Science, January 2018, vol. 115, no. 4, p.629. www.pnas.org/cgi/doi/10.1073/pnas.1721721115

Christensen, H. **(**1943) Textbook on dyeing with plants. [*Lærebok i farging med planter*]. 8st edn, Oslo: Cappelen.

Center for Invasive Species and Ecosystem Health: *Dyers Woad* (Date of collection: 12.07.22) https://www.invasive.org/weedcd/pdfs/wow/dyers_woad.pdf

Cucu, A. et al. (2021) *New Approaches on Japanese Knotweed (Fallopia japonica) Bioactive Compounds and Their Potential of Pharmacological and Beekeeping Activities: Challenges and Future Directions.* Plants (Basel). doi: 10.3390/plants10122621

Dennis, A. (2022) Invasive Apothecary, https://ecliptaherbal.com

Gorjanc, M. et al. (2019) *Cationic Pretreatment of Cotton and Dyeing with Fallopia Japonica Leav*es, University of Ljubljana, Faculty of Natural Sciences and Engineering, Ljubljana, Slovenia

Jorgensen, L. B. and Waltson, P. (1986*)* Dyes and Fleece Types in Prehistoric Textiles from Scandinavia and Germany, *Journal of Danish Archaeology*, 5, pp 177-188.

Lachowicz S. and Oszmiański J. (2019) Profile of Bioactive Compounds in the Morphological Parts of Wild Fallopia japonica (Houtt) and Fallopia sachalinensis (F. Schmidt) and Their Antioxidative Activity. *Molecules*; 24, 1436. doi: 10.3390/molecules24071436.

Lukešová, H., Palau, A. and Holst, B. (2017) `Identifying plant fibre textiles from Norwegian Merovingian Period and Viking Age graves: The Late Iron Age Collection of the University Museum of Bergen.` *Journal of Archaeological Science: Reports 13,* pp. 281-285, doi.org/10.1016/j.jasrep.2017.03.051

Moore, D. (2019) *Datasheet Isatis tinctoria (dyer's woad)*, Invasive Species Compendium, Egham, UK: CABI. https://www.cabi.org/isc/datasheet/28902

Orion, T. (2015) *Beyond the war on invasive species. A permaculture approach to ecosystem restoration.* Vermont; Chelsea Green Publishing

Recker, K. (2020) *True colors, world masters of natural dyes and pigments.* Colorado: Thrums books

Royal College of Art London (2020), Marina Belintani, https://2020.rca.ac.uk/students/marina-belintani

Sagberg, A. (2017) *Vaid. En historie om blått.* 2nd edn. Stamsund: Orkana Forlag

Shaw, D. (2013) *Datasheet Fallopia japonica (Japanese knotweed).* Invasive Species Compendium. Wallingford, UK: CABI. DOI:10.1079/ISC.23875.20203373912

Skard, O. (2003) *Ville vekster, røtter i kulturhistorien*. Oslo: Landbruksforlaget

The Woad Centre (2012), *The Woad Centre*. Norfolk, UK: http://www.thewoadcentre.co.uk

United Nations Environment Programme (2021) *Making Peace with Nature: A scientific blueprint to tackle the climate, biodiversity and pollution emergencies.* Nairobi. https://www.unep.org/resources/making-peace-nature

Wilhelmsen, S. (2022) *The Settlers – towards new territories in design*, Ongoing PhD project, University of Bergen, Faculty of Fine Art, Music and Design, The Department of Design

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Appendix B

Siren Elise Wilhelmsen (2023)
Fieldnotes from the Forbidden Garden

BioColours, Aalto University Press

Essay for book. Full Text.

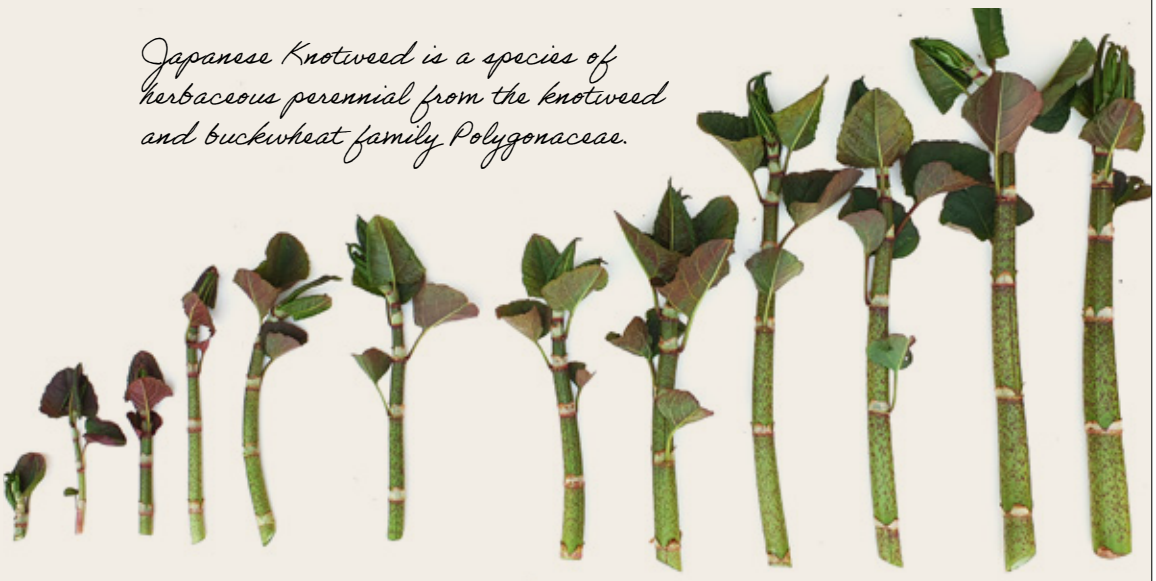

BIO
colours
SUSTAINABLE STORIES FROM
NATURE, LAB AND INDUSTRY
Aalto University
Kirsi Niinimäki & Julia Lohmann (Eds.)

Photos Siren Elise Wilhelmsen (left), Julia Lohmann (right)

Japanese Knotweed / Asian knotweed

(Reynoutria japonica / Fallopia japonica / Polygonum cuspidatum)

Japanese Knotweed is a species of herbaceous perennial from the knotweed and buckwheat family Polygonaceae.



A native of East Asia, it was brought as a decorative plant to North America and Europe, where it is classified as an invasive species. It spread via far-reaching rhizomes in the soil and through seeds.

Photo Siren Elise Wilhelmsen

Japanese knotweed has large, alternating trowel-shaped leaves and may grow up to three meters tall, sometimes up to 20 centimeters in a day. It can suppress native plants by depriving them of light and nutrients and its strong roots and shoots may damage roads and building foundations.

However, Japanese knotweed is also a source of nectar to bees and birds eat its seeds. Japanese knotweed can be foraged as food and prepared like rhubarb. Its leaves and rhizome can be used to create a natural dye in yellow and orange colours.

Siren Elise Wilhelmsen

Fieldnotes from the "forbidden garden"

A journey through the colour palette of a group of "invasive alien plant species" in Norway.

ABSTRACT

This essay explores a design-driven study on colours and approaches concerning invasive alien plant species. While outlining the colour palette of textile dyes represented by plants considered invasive to Norway, it also presents both a personal story and a collective perspective for future production and consumption. The "forbidden garden" refers to the author's childhood playground in her grandmother's garden, which has gradually become inhabited by plants that are now considered unwanted or forbidden. The author questions the traditional approach of removing and eradicating invasive plants and advocates for a more holistic approach that takes into account the complexity of the ecosystem in combination with human impacts. Colour discoveries demonstrate the potential of an alternative approach and focus specifically on the possibilities of using Japanese knotweed rhizomes as a textile dye. This plant has become known as one of the world's most invasive species, although it has been valued as a useful plant for centuries.

Keywords
Colour palette, invasive alien plant species, Japanese knotweed, new local flora, natural resources, holistic approach

On the left wool yarn dyed with Japanese knotweed.

Photo Julia Lohmann and Siren Elise Wilhelmsen

Photo Niklas Sebastian Alveberg

Introduction

Siren Elise Wilhelmsen

To begin this essay, I would like to introduce you to the concept of a rhizome. Botanically, a rhizome can be described as a "mass of roots". Unlike the root of a tree, where the branches and roots grow from one central point, the rhizome is structured as a network. What makes rhizomes unique is their ability to allow new root-shoots to grow upwards and become a plant stem instead of a root-stem. Any shoot can become a new plant, making rhizomes highly adaptable. Additionally, if a rhizome is separated, each piece can give rise to a new plant. These complex structures demonstrate impressive survival mechanisms, producing clones through highly effective vegetative reproduction systems. One of the very first rhizomes I ever held in my hand belonged to a plant called Japanese knotweed, *Fallopia japonica* (synonyms *Fallopia reynoutria* and *Polygonum cuspidatum*). Its rhizomes can reach lengths up to seven meters, and its shoots can work their way through concrete, while root fragments as small as one centimetre can give rise to new plants. These are probably some of the reasons why this plant has become famous as 'one of the world's most invasive plants'. However, in my grandmother's garden, where I first became familiar with it, it was never an enemy. My sister and I used to explore its vast territory of expansion, what we called 'the jungle', making paths and clearings across the area. The tall stems of the Japanese knotweed became swords, flutes, and building material for our imaginative play.

The house and garden were built by my great-grandparents in the 1920s on a wind-swept island on the Norwegian west coast. Any plant that would provide shelter from the wind was an appreciated feature (Figure 1). The suggestion to use knotweed probably came from the garden architect, who was hired to plan a large fruit and berry garden with beds of flowering perennials and herbs. The goal was to create a garden that was both useful and beautiful, providing shelter from the wind and adding a variety of colours to the landscape.

1

The introduction of Japanese knotweed to Europe can be traced back to the first half of the 19th century when Philipp Franz von Siebold, a German physician, botanist, and adventurer, brought over 1000 living plant specimens to Europe from Japan between 1823 and 1841 (Bailey & Conolly, 2000). Among these specimens were hosta, hortensia, and Japanese knotweed. While in Japan, Siebold learned about the edible young stems of knotweed and the medicinal value of its roots in Japanese and Chinese medicine. However, in Europe, knotweed was primarily valued as an ornamental plant, and it was even awarded a gold medal for being the most interesting ornamental plant of the year in 1847 by the *Society of Agriculture and Horticulture* in Utrecht (Bailey & Conolly, 2000). As a result, it quickly became a popular choice among garden and park owners throughout Europe. The plant most likely arrived in Norway in

1 The bare landscape surrounding the house and garden, 1930.
Photographer unknown

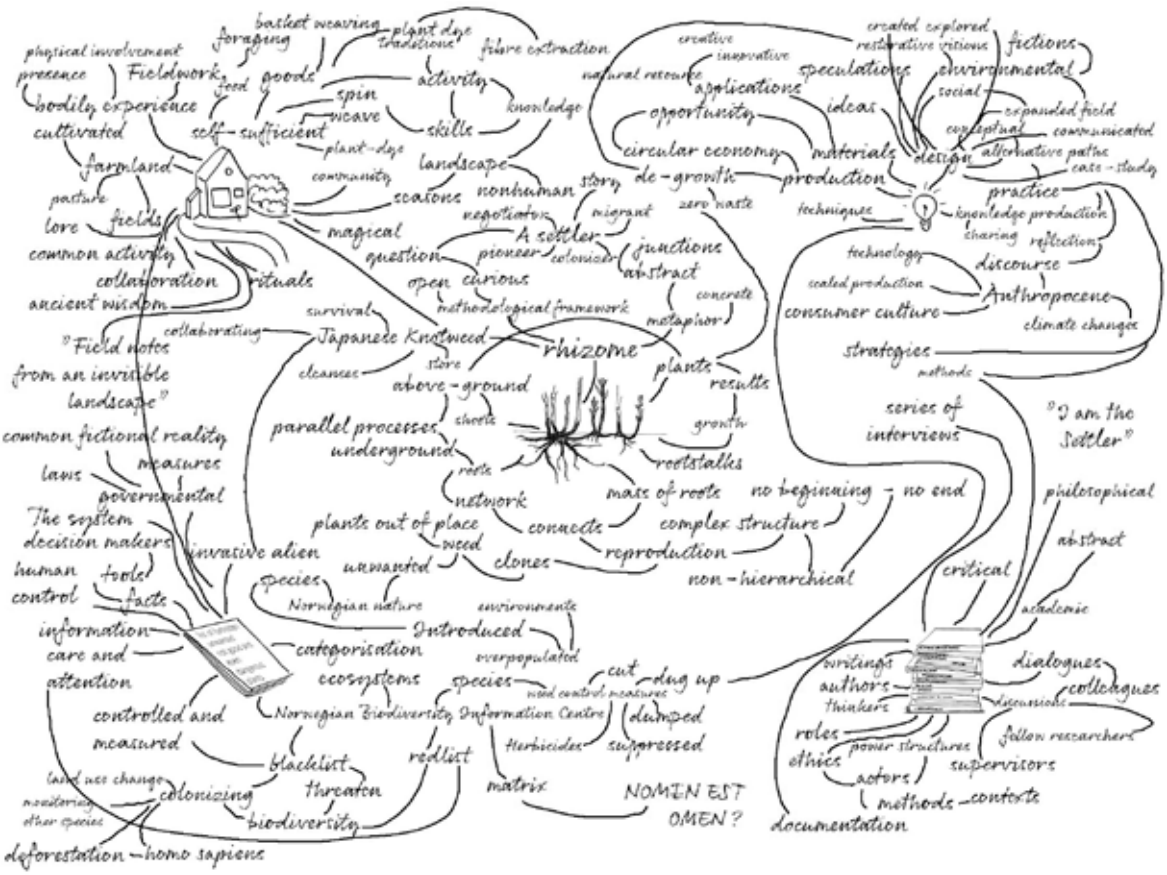
2 The author working with Japanese knotweed in her grandmother's garden, 2019.
Photo Niklas Sebastian Alveberg

2

the 1860s or 1870s (Elven et al., 2018), and by the time the garden architect suggested using it in my great-grandparents' garden, it had already become an established newcomer.

It is somewhat unclear which other ornamental plants were part of the original garden plan, and which were added later. Lupins and lilacs are visible in a photograph dating back to 1938. Today, the garden includes not only fruits, berries, roses, knotweed, and lupins, but also several plants listed as invasive alien plant species (IAPS) in Norway, including yellow loosestrife, *Lysimachia punctata*, beach rose, *Rosa rugosa*, Sitka spruce, *Picea sitchensis*, goatsbeard, *Aruncus dioicus*, red elderberry, *Sambucus racemose*, cotoneaster, *Cotoneaster bullatus*, and Scotch broom, *Cytisus scoparius*.

While the term "weed" can refer to any plant growing in an undesired location, IAPS specifically describes non-native plants that become overpopulated and negatively impact their new environments, causing economic or ecological harm (Orion, 2015). Invasive plants



3 A conceptual (rhizomatic) mind-map of Siren Elise Wilhelmsen's PhD project.

can displace particular native species, reduce biodiversity, and alter ecosystem functions, resulting in negative impacts on wildlife and essential ecosystem services such as water purification and pollination. In addition, invasive plants can have economic impacts, such as reducing crop yields, damaging infrastructure, and increasing management costs. Yet, the question remains whether removal and eradication is the best solution, or if the complexity requires a different and more holistic approach. The current state of the world, including the climate crisis, biological mass extinction, growing human population, pandemic, and unstable political landscape, calls for a fundamental rethinking of production and consumption practices. Perhaps we need to start by addressing the underlying issue of our relationship to the natural world?

Over the years, my grandmother's garden has become a place for reflecting upon the changing attitudes towards nature and the environment. What was once a barren and windswept landscape has evolved into a thriving habitat that supports a diverse range of species. For me, the garden serves as a reminder of our impact on the natural world, both positive and negative, and highlights our responsibility to make informed decisions about how we interact with nature.

My childhood memories of encountering Japanese knotweed have inspired me to view the "forbidden garden" as a place of opportunity, rather than a graveyard for poor choices, and to leverage my profession as a designer to explore these possibilities (Figure 2). Design is a field that bridges industry, crafts, and science and has the potential and responsibility to be a driver of transformation through functionality, creativity, and storytelling. In my PhD project in artistic research, called "The Settlers – Towards New Territories in Design", I approach IAPS as new local plants from which we can learn. By gathering stories about their edibility, environmental benefits, health benefits, colourants, fibre, and wood applications, we can create a new landscape of knowledge and understanding.

The following pages present the preliminary findings on colourants for textile dyeing derived from invasive alien plant species (IAPS) in Norway, with a particular focus on the results of the Japanese knotweed. These findings were first presented at the "XVII CONFERENZA DEL COLORE" in Florence in September 2022 in the presentation and paper "Plants out of place? A design-driven investigation of colour and material possibilities within a group of "invasive alien plant species" in a Norwegian context" (Wilhelmsen, 2022).

Plant dye as a historical local possibility

In Norway, as in most parts of Europe, the knowledge of dyeing with natural pigments has a long history. Early findings of plant-dyed cloth date back to the Late Roman Iron Age (Lukešová et al., 2017). It is assumed that mostly local plants were in use at this time, although imported colourants such as the red alizarin and purpurin from madder, *Rubia tinctorum*, and the blue indigotin from woad, *Isatis tinctoria*, have been identified in various textile samples (Bender & Walton, 1986). Woad seeds from 834 A.D. were found at the Viking Age ship

burial site at Oseberg (Sagberg, 2017). It has also been proven that local variations of madder-like red dyes have been used, such as bedstraw, *Galium verum L.*, and Northern bedstraw, *Galium boreale L.*, as well as a whole range of local, unidentified, yellow dyestuff (Bender & Walton, 1986).

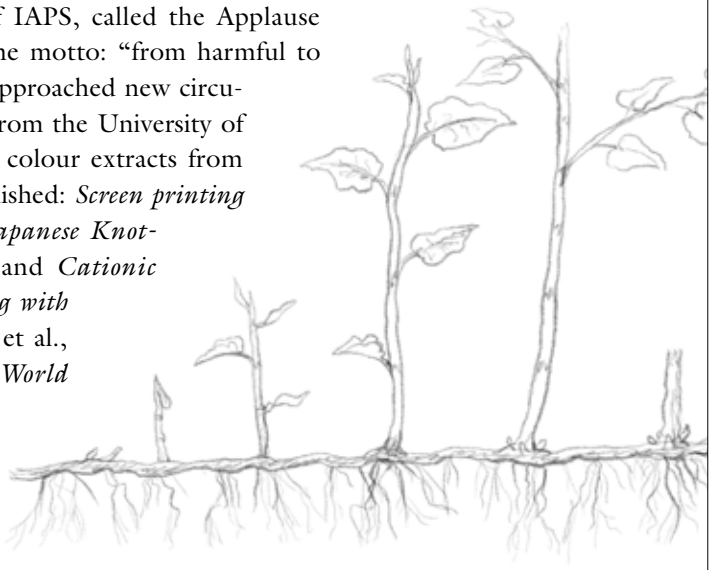
For centuries, natural dyes were the main colourants accessible for textile dyeing. However, with the development of synthetic dyes at the beginning of the twentieth century, the interest in and further development of natural dyes stagnated (Bechtold et al., 2003). In Norway, Hilda Christensen was one of the first to gather and preserve the knowledge of the old dye traditions (Christensen, 1924). Her textbook *Lærebok i farging med planter* ("Textbook on dyeing with plants") on natural dyeing was published 1908. In it, she presented recipes containing imported dyestuffs, like cochineal, indigo and madder. But, her focus was mainly directed towards local barks, leaves, twigs, herbaceous plants, and lichens, most of which are still viable in the Norwegian flora today. Despite this rich history, a hundred years of industrial production has had a huge impact on the environment and humans.

Over the years the landscape and flora has been drastically transformed, making the starting point for gathering and harvesting today very different than it was for Hilda and her contemporaries. Visible changes such as expanded urban, agricultural, and industrialized areas, infrastructure, and electrical power systems are evident even at a distance. Other changes must be experienced, such as certain climatic changes, or discovered up close, like the range of new species (UNEP, 2021). Since 1800, over two-thousand non-native alien plant species have settled in the Norwegian flora (Artsdatabanken, 2018). This new point of departure makes it apparent that we need to rethink, restructure, and re-establish our relationship with the environment.

Although most IAPS in Norway have been introduced as ornamental plants, some have long histories as cultural and useful plants elsewhere. Plants which are labelled as invasive in one place may be appreciated or protected in another context. Dyer's woad, *Isatis tinctoria*, has for instance been a sought- after resource throughout history. Today it has pest status in some western states of the United States (Weyl, 2022), while in the UK it is being reintroduced as a commercial dyestuff and cultivated as a such (TheWoadCentre, 2012). Similarly, Japanese knotweed is today known as one of the

world's most invasive species yet valued in countries where it has cultural purposes. In Japan, it is known as *Itadori*, which translates to "tiger cane". This name may refer to the plant's vigorous growth and resilience, similar to the strength and power of a tiger. It has been used as a traditional medicine for centuries. Its root is a rich source of resveratrol and is still sold in nutritional supplements, and its young shoots are consumed as a vegetable (Shaw, 2013).

As the PhD project "The Settlers – Towards New Territories in Design" started at the University of Bergen, Faculty of Fine Art, Music and Design in 2018, the first case study and following exhibition, *Interpreting Fallopia japonica* presented a design perspective on Japanese knotweed, focusing on materials and colours. A range of warm yellows to ochre and golden brown were achieved by boiling its rhizomes without mordants. At the time, little research was found on colours and materials from IAPS. But in the following years an increased focus on the topic has resulted in interesting studies and projects world-wide. To mention some: NYC based artist Ellie Irons has through her project "invasive pigments" made watercolour from local IAPS (Beans, 2018), Alyssa Dennis based in Maryland (US) has started the "Invasive Apothecary", where she works with IAPS as part of her multidisciplinary art and clinical herbal pharmacy practice (Dennis, 2022), UK-based designer Marina Belintanis devoted her MA degree to material research on Japanese knotweed (RCA, 2020), and the city of Ljubljana has made a major investment concerning the handling of IAPS, called the Applause project (UIA, 2022). Based on the motto: "from harmful to useful", citizen-led activities have approached new circular economic and social systems. From the University of Ljubljana, two papers concerning colour extracts from Japanese knotweed have been published: *Screen printing with Natural Dye Extract from Japanese Knotweed Rhizome* (Klančnik, 2021) and *Cationic Pretreatment of Cotton and Dyeing with Fallopia Japonica Leaves* (Gorjanc et al., 2019). The book, *True Colors: World*



Growth stages of Japanese knotweed

Masters of Natural Dyes and Pigments (Recker, 2020), presents the story of Avani, a non-profit organization in India. Their mission is to bring back community-driven, local textile production and responsibly made goods. Research on regional dyestuff revealed that a local pest plant, *Ageratina adenophora*, could yield a range of yellow and green dyes. Through regular harvesting, thereby removing the plant from the woods, the community helps balance the local ecosystem, which was suffering by the invasion of this plant. At the same time, the community accesses a wild growing dyestuff which is plentiful.

These examples are intriguing indications of a shifting mindset towards sustainable economic and social systems, based on holistic handling of IAPS as natural resources.

Outlining the palette – an experiment

The colour research presented here has focused on forty-five of the IAPS labelled with the "highest risk assessment" in Norway. A mapping of historical and present-day usage, descriptions, and indications of colour extraction became the starting point for the practical colour study. Availability constraints resulted in some plants being recorded based solely on the mapping without being tested in the studio, while others underwent multiple tests focusing on different parts of the plant. The tests were performed as dyes for textile, still the palette can hopefully be useful for a broader field.

Hilda Christensen's textbook formed the basis for all recipes and the process of generating the dye samples. It must be emphasized that these were studio experiments and not lab-tests. Chemical components, lightfastness, wash fastness, and a systematic treatment of each single dyestuff have not been examined. In this early-stage study, the focus was on outlining the palette.

A broad range of shades and colour depths has been achieved by applying natural dyestuffs in various mordants. Alum was used as a pre-mordant in a separate immersion bath for the fibres, while vinegar, ammonium chloride, iron, and potash were used as separate post-mordants. The dyeing process involved boiling the dyestuff in tap water in a stainless-steel pot, with various plant materials like stems, twigs, leaves, petals, bark, fruits, and roots, which had been cut into small pieces. Dyestuff was boiled in water and allowed to soak

for twenty-four hours before adding the fibre and heating it for an hour. The textile material was then split into 4 parts and treated with different post-mordants before being air-dried. Some mordants used by Christensen, such as tin and copper, are toxic and have been left out of this study. Others, such as cream of tartar, citric acid, or baking soda, will be considered for further development.

Results

The study employs four distinct mordants and showcases a total of 132 swatches, including frequent examples of yellows, greens, greys, beiges, and browns. However, apricot, rose, and orange are less common, while purple is only found twice, and one outcome displays turquoise and one red (Figure 4).

Approximately two-thirds of the high-risk group and two percent of the total group of IAPS in Norway have been mapped. Despite the limited scope, the results showcase a diverse and vibrant palette, providing a starting point for further exploration. Some colours stand out for their vivid and brilliant hues, such as the yellow shades extracted from crack willow, *Salix* × *fragilis*, and goat's beard, *Aruncus dioicus*, the yellow, green and turquoise tones obtained from large-leaved lupine, *Lupinus polyphyllus*, and the rose shades derived from meadowsweet shrub *Spiraea* × *billardii*. Other noteworthy findings include the various shades of green produced by Scotch broom, *Cytisus scoparius*, which shift from yellow-green in April-May to deeper greens and browns throughout the season. Iron proves to be a powerful colour shifter, yielding dark browns, grays, and greens. Further exploration is needed to fully understand the range of hues and develop a reproducible scheme. Alkaline additives like ammonium chloride and ash water tend to produce warmer nuances.

Some dyestuffs, such as the Sitka spruce, *Picea sitchensis*, show minimal reaction to changes in acidity, while others, like the dyestuff derived from Japanese knotweed rhizomes, are pH-sensitive. The study found that this dyestuff revealed the most significant colour shifts when exposed to varying levels of acidity or alkalinity in the dye baths. Previous research on Japanese knotweed had exposed warm yellow, ochre, and brown hues. However, this study uncovered

4 On the next pages:
Overview of colours, with information about the plant sources, condition of dyestuff, mordants, and range of colours. The fibre used for testing is 100% neutral white sheep wool. Related plants, where the results are expected to be similar, are placed under the same number in this overview. The first name is the plant that was actually tested.

PLANT	PART	CONDITION	TESTED	COLOUR (INDICATION)	ALUMINUM SULFATE	AMMONIUM CHLORIDE	POTASSIUM CARBONATE	IRON(II) SULPHATE	PLAIN VINEGAR
1. ALASKAKORNELL / Red-osier Dogwood / *Swida sericea*	Twig	Fresh	June	Yellow / Grey	x				
2. ALPEASAL / Mougeot's Whitebeam/ *Sorbus mougeotii*	Bark	-	-	Yellow / Brown					
3. ALPEFURU / (busk-furu)/ (Swiss) Mountain Pine / *Pinus mugo* (**VRIFURU** / Lodgepole Pine / *Pinus contorta*)	Needle Cone	- -	- -	Green Brown					
4. ALPEGULLREGN / Scotch Laburnum / *Laburnum alpinum*	Flower / Leaf	-	-	Yellow					
5. BLEIKSPIREA / Meadowsweets / *Spiraea xnubella*	Twig	Fresh	June	Apricot	x				
6. BLÅHEGG / Juneberry, Serviceberry / *Amelanchier spicata*	Berry	-	-	Purple					
7. BLÅLEDDVED / Fly Honeysuckle/ *Lonicera caerulea (var. Edulis)*	Berry	-	-	Purple					
8. BOERSVINEBLOM / Narrow-leaved Ragwort / *Senecio inaequidens*	Leaf Flower	- -	- -	Green / Yellow Brown / Orange					
9. BULKEMISPEL / Hollyberry Cotoneaster/ *Cotoneaster bullatus* (**BLOMSTERMISPEL** / Showy Cotoneaster / *Cotoneaster multiflorus*) (**DIELSMISPEL** / Diels' Cotoneaster/ *Cotoneaster dielsianus*) (**SPRIKEMISPEL** / Spreading Cotoneaster / *Cotoneaster divaricatus*)	Leaf	Fresh	May	Beige / Brown	x				
	Root	Fresh	May	Rose	x				
	Berry	-	-	Beige / Rose / Brown	x				
10. FAGERFREDLØS / Dotted Loosestrife / *Lysimachia punctata*	Flower	Fresh	July	Yellow / Green	x				
	Root	Fresh	July	Beige / Brown	x				
11. GRØNNPIL/ Crack Willow / *Salix × fragilis (Salix × rubens)*	Leaf	Fresh	July	Yellow / Green	x				
12. GULLREGN / Laburnum / *Laburnum anagyroides*	Bark Flower	- -	- -	Brown Yellow/ Orange					
13. GYVEL / Scotch Broom / *Cytisus scoparius*	Stem w/ buds	Fresh	April	Green	x				
	Flowering stem	Fresh	July	Green	x				
14. HAGELUPIN / Big-Leaf Lupin, Lupine / *Lupinus polyphyllus* (**JÆRLUPIN** / Sundial Lupine / *Lupinus perennis*)	Blue flowers	Fresh	July	Green/Turquoise	x				
(**SANDLUPIN** / Blue Lupine / *Lupinus nootkatensis*)	Stem / Leaf	Dried	July	Yellow	x				
15. HYBRIDBARLIND / Anglojap Yew / *Taxus x media*	Stem / Bark	Fresh	June	Apricot / Brown	x				
16. HØSTBERBERIS / Japanese Barberry / *Berberis thunbergii* / green leaves	Stem / Leaf	Fresh	July	Yellow / Grey	x				
- / red leaves	Stem / Leaf	Fresh	July	Apricot / Yellow	x				
17. JAPAN PESTROT / Sweet Coltsfoot, Butterbur / *Petasites japonicus*	Leaf	-	-	Yellow / Orange					

18. KANADAGULLRIS / (Giant-)Goldenrod / *Solidago canadensis (+ gigantea serotina)*	Flowering stem	-	-	Yellow / Green/ Grey	x	
19. KJEMPESPRINGFRØ / Himalayan Balsam / *Impatiens glandulifera*	Stem/ Leaf/ Flower	-	-	Ginger/ Brown		
20. KLASESPIREA / Meadowsweets / *Spiraea ×billardii*	Twig	Fresh	July	Rose	x	
21. KLISTERSVINEBLOM / Sticky Groundsel / *Senecio viscosus*	Leaf Flower	- -	- -	Green Yellow / Brown		
22. KRYPFREDLØS / Creeping Jenny / *Lysimachia nummularia*	Root	Fresh	Sept	Brown / Grey	x	
	Leaf / Stem	Fresh	Sept	Yellow / Beige / Grey	x	
23. MONGOLSPRINGFRØ / Smallflower Touchmenot / *Impatiens parviflora*	Leaf / Stem	-	-	Yellow		
24. PARKGULLTVETANN / Yellow Archangel / *Lamiastrum galeobdolon galeobdolon*	Leaf / Stem	-	-	Green / Beige		
25. PARKSLIREKNE / Japanese Knotweed / *Reynoutria japonica, Fallopia japonica*	Leaf	Fresh	May	Yellow / Ochre / Grey	x	
(HYBRIDSLIREKNE, Bohemian Knotweed / *Reynoutria x bohemica)*	Root	Fresh	July	Yellow / Orange Red / Green	x	
26. PLATANLØNN / Sycamore / *Acer pseudoplatanus*	Bark / Twig	Fresh	June	Beige	x	
	Leaf	Fresh	June	Yellow	x	
27. PRAKTMARIKÅPE / Lady's-mantle / *Alchemilla mollis*	Leaf / Stem	Fresh	May	Yellow / Green	x	
28. PURPURSPIREA SPIREA (Bjarkøyspirea) / Meadowsweets / *Spiraea x rosalba*	Twig	Fresh	July	Rose	x	
29. RYNKEROSE / Beach Rose / *Rosa rugosa*	Hip	Dried	July	Beige	x	
	Petal	Dried	June	Beige / Brown	x	
30. RØDHYLL / Red Elderberry / *Sambucus racemosa*	Berry	Dried	August	Beige / Green	x	
31. SKOGSKJEGG/ Goat's Beard / *Aruncus dioicus*	Leaf / Stem	Fresh	June	Yellow / Green	x	
32.SNØBÆRBUSK/ Common Snowberry /*Symphoricarpos albus (L.) S.F.Blake*	Twig	Fresh	June	Yellow / Grey	x	
33. SITKAGRAN (+Lutzgran) / Sitka Spruce/ *Picea sitchensis (+Picea xlutzii)*	Needle / Twig	Fresh	June	Beige / Brown	x	
34. TROMSØPALME / (Persian) Hogweed / *Heracleum persicum, Heracleum tromsoensis*	Leaf / Stem	Fresh	June	Yellow / Grey	x	
35. VESTAMERIKANSK HEMLOKK / Western Hemlock / *Tsuga heterophylla*	Bark	Fresh	May	Brown	x	
36. VALURT / Comfrey / *Symphytum officinale*	Leaf / Stem	-	-	Green		
37. ULLBORRE / Woolly Burdock / *Arctium tomentosum*	Root	-	-	Green / Beige		

dramatic colour changes in the dyestuff based on the pH of the solution. For instance, adding iron produced an olive-green colour, while alkalic agents generated an array of reddish hues. Furthermore, a test conducted without alum-treated fibres resulted in orange colours with ammonium chloride and rose shades with potashes. Additionally, the dyestuff was tested in a cold-dye for a week, which produced softer and paler tones of the same variety of colours. The experiments resulted in a wide range of hues achieved with Japanese knotweed (Figure 5). Although further testing is necessary to determine wash fastness, rub fastness, and lightfastness for all samples, the Japanese knotweed swatches from 2018 remained unchanged after washing, and retained their colour quality, albeit slightly darker.

Conclusions

My childhood experiences from the 'forbidden garden' and my acquaintance with the Japanese knotweed have influenced the direction of my career path and research interests. Not only has this plant fascinated me with its range of applications, such as medicine, food, and colours, but its rhizomes have taught me something even more important. The flexible and open structure of the rhizomes provides a perspective, or even a recipe, for a way of being in the world. The rhizomatic network prioritizes collaboration and interdependence over hierarchy and control, challenging the dominant linear and vertical structures of modern society that prioritize individualism and competition. By valuing the interconnectedness of all things, we can create more sustainable and equitable systems that prioritize the well-being of both people and the living planet. Through this perspective, the rhizome offers a powerful metaphor for understanding our place in the world, embracing a holistic approach to production and consumption, with the goal of moving toward a more collaborative, interconnected, and sustainable future.

By approaching the group of IAPS with this mindset, a new narrative can be articulated. The group of invasive alien plant species

(IAPS) in Norway must be adaptable and robust to thrive in this harsh environment. They do not require fields, as they often grow in urban areas where native plants cannot survive, which provides an opportunity to activate abandoned and unmanaged areas of the city for material harvesting, combining it with maintenance of vulnerable areas (Orion, 2015). Harvesting in this way could be time-consuming

5 Dye swatches of Japanese knotweed.
Photo Siren Elise Wilhelmsen

since it might involve moving from site to site. On the other hand, cultivating dye crops in a field would involve ploughing, seed bed preparation, and weed control (Bechtold et al., 2003). Furthermore, replacing harmful and labour-intensive measures, used to combat IAPS, with knowledge and care could result in natural reduction and balance based on utilisation, local production, and circular economy.

Creating new plant-based palettes and site-specific recipes makes it possible to generate dyes from renewable natural sources, as opposed to synthetic dyes produced with substances from non-renewable and non-local sources. The process can be a social practice, a local business, or a forager's way of reducing consumption and collecting colourants for personal use. The harvest and preparation of dyestuffs from local plants connects us to the plants, the environments and landscapes in which they grow. It is also a way of reconnecting with the past and traditions passed on from artisans through history, while also paving the way towards a balanced and fertile coexistence in the future.

The colour study demonstrates that IAPS can be promising dye plants for the future. Although the results should be seen as indicators rather than absolute answers, potential applications include textile dye production, development of inks, lake-pigments, and food-colourants, as well as paints for architecture and design, natural stained paper, and colourants for cosmetics and pharmaceuticals.
The aim of these fieldnotes from the "forbidden garden" has been to add new knowledge and insight from involvement with a group of invasive alien plant species in a Norwegian context, with transfer value to other communities and ecosystems. This can hopefully contribute to widening the range of information available and draw further attention to the potential of pushing the boundaries of local resources and a holistic approach to colour production at any scale.

References

Artsdatabanken. (2018). *Fremmedartslista 2018*. Artsdatabanken. Retrieved 2023/14/04 from https://www.artsdatabanken.no/fremmedartslista2018

Bailey, J. P. & Conolly, A. P. (2000). Prize-winners to pariahs - a history of Japanese knotweed s.l. (Polygonaceae) in the British Isles. *New Journal of Botany*, *23*, 93-110.

Beans, C. (2018). Painting with invasive pigments. *Proceedings of the National Academy of Sciences, 115*(4), 627-629. https://doi.org/10.1073/pnas.1721721115

Bechtold, T., Turcanu, A., Ganglberger, E. & Geissler, S. (2003). Natural dyes in modern textile dyehouses — how to combine experiences of two centuries to meet the demands of the future? *Journal of Cleaner Production, 11*(5), 499-509. https://doi.org/https://doi.org/10.1016/S0959-6526(02)00077-X

Bender, L. & Walton, P. (1986). Dyes and Fleece Types in Prehistoric Textiles from Scandinavia and Germany. *Journal of Danish Archaeology, 5*, 177–188. https://doi.org/https://doi.org/10.1080/01084 64X.1986.10589966

Christensen, H. (1924). *Lærebok i farvning med planter*. Cappelen. https://doi.org/oai:nb.bibsys.no:990118325254702202 URN:NBN:no-nb_digibok_2021041348603

Dennis, A. (2022). *Invasive Apothecary* Retrieved 2022/08/01 from https://ecliptaherbal.com

Elven, R., Hegre, H., Solstad, H., Pedersen, O., Pedersen, P. A., Åsen, P., A. & Vandvik, V. (2018). *Reynoutria japonica, vurdering av økologisk risiko*. Artsdatabanken. Retrieved 2023/14/04 from https://www.artsdatabanken.no/Fab2018/N/1130

Gorjanc, M., Kert, M., Mujadžić, A., Simoncic, B., Tavčer, P., Tomsic, B. & Kostajnšek, K. (2019). Cationic Pretreatment of Cotton and Dyeing with Fallopia Japonica Leaves. *Tekstilec, 62*, 181-186. https://doi.org/10.14502/Tekstilec2019.62.181-186

Klančnik, M. (2021). Screen Printing with Natural Dye Extract from Japanese Knotweed Rhizome. *Fibers and Polymers, 22*(9/2021). https://doi.org/DOI 10.1007/s12221-021-0955-4

Lukešová, H., Palau, A. S. & Holst, B. (2017). Identifying plant fibre textiles from Norwegian Merovingian Period and Viking Age graves: The Late Iron Age Collection of the University Museum of Bergen. *Journal of Archaeological Science: Reports, 13*, 281-285. https://doi.org/https://doi.org/10.1016/j.jasrep.2017.03.051

Orion, T. (2015). *Beyond the war on invasive species. A permaculture approach to ecosystem restoration*. Chelsea Green Publishing.

RCA. (2020). *Marina Belintani*. Royal College of Art. Retrieved 2022/09/06 from https://2020.rca.ac.uk/students/marina-belintani

Recker, K. (2020). *True colors, world masters of natural dyes and pigments*. Thrums books.

Sagberg, A. (2017). *Vaid : en historie om blått* (Ny utg. [i.e. 2. utg.]. ed.). Orkana.

Shaw, D. (2013). *Fallopia japonica (Japanese knotweed)* CABI International. https://doi.org/10.1079/cabicompendium.23875

TheWoadCentre. (2012). *About Woad-inc*. The Woad Centre. Retrieved 2023/12/04 from http://www.thewoadcentre.co.uk

UIA. (2022). *About APPLAUSE*. The Urban Lab of Europe. Retrieved 2023/13/04 from https://www.uia-initiative.eu/en/operational-challenges/ljubljana-applause#main

UNEP. (2021). *Making Peace with Nature: A scientific blueprint to tackle the climate, biodiversity and pollution emergencies*. (978-92-807-3837-7). Nairobi: United Nations Environment Programme Retrieved from https://www.unep.org/resources/making-peace-nature

Weyl, P., Moore, D. (2022). *Isatis tinctoria (dyer's woad)* (Vol. CABI Compendium). CABI International. https://doi.org/10.1079/cabicompendium.28902

Wilhelmsen, S. E. (2022). Plants out of place? A design-driven investigation of colour and material possibilities within a group of "invasive alien plant species" in a Norwegian context. In A. Siniscalco (Ed.), *Colour and Colorimetry. Multidisciplinary Contributions*. (Vol. Vol. XVII A). Gruppo del Colore - Associazione Italiana Colore. https://doi.org/https://doi.org/10.23738/RCASB.006

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Bibliography

Bailey, J. P., & Conolly, A. P. (2000). *Prizewinners to pariahs - a history of Japanese knotweed s.l. (Polygonaceae) in the British Isles.* New Journal of Botany, 23, 93-110.

Barstow, S. (2014). *Around the world in 80 plants. An edible perennial vegetable adventure for temperate climates.* Permanent Publications.

Bechtold, T., Turcanu, A., Ganglberger, E., & Geissler, S. (2003). *Natural dyes in modern textile dyehouses — how to combine experiences of two centuries to meet the demands of the future?* Journal of Cleaner Production, 11(5), 499-509. https://doi.org/10.1016/S0959-6526(02)00077-X

Bender, L., & Walton, P. (1986). *Dyes and fleece types in prehistoric textiles from Scandinavia and Germany.* Journal of Danish Archaeology, 5, 177-188. https://doi.org/10.1080/010846 4X.1986.10589966

Benjamin, W. (1999). *The work of art in the age of mechanical reproduction.* Illuminations (pp. 214-18). London: Fontana. (Original work published 1955).

Bergfjord, C., Mannering, U., Frei, K. M., Gleba, M., Scharff, A. B., Skals, I., Heinemeier, J., Nosch, M.-L., & Holst, B. (2012). *Nettle as a distinct Bronze Age textile plant.* Scientific Reports, 2(664). https://doi.org/10.1038/srep00664

Blaafarveværket. (n.d.). *Koboltgruvene.* Retrieved May 16, 2024, from https://blaa.no/en/koboltgruvene/?fbclid=IwAR0w4HsJnu7zGxP2dV4QC-mj_VSNthcBSBFVxAOnQHNYMWCsMHJshoBb-Ic

Biomimicry Institute. (n.d.). Retrieved from https://biomimicry.org

Bregman, R. (2018). *Utopia for Realists: How We Can Build the Ideal World*, Spartacus Forlag

Bugge, A. B. (2019). *Fattigmenn, tilslørte bondepiker og rike riddere. Mat og spisevaner i Norge fra 1500-tallet til vår tid.* Cappelen Damm Akademisk.

Byantikvaren i Bergen kommune. (2021). *Kulturmiljøplan for Bergen. Del 2 og 3. Kulturmiljøplan plan for Bergen 2021-2025, Identitet med særpreg, 51-52.* Retrieved from https://www.bergen.kommune.no/api/rest/filer/V447093

Cappuccio, S. (2010). *Bioregionalism as a new development paradigm. Papers on Territorial Intelligence and Culture of Development*. ENTI,Salerno.

Carrington, D. (2024, March 22). *Geologists reject declaration of Anthropocene epoch.* The Guardian. Retrieved from https://www.theguardian.com/science/2024/mar/22/geologists-reject-declaration-of-anthropocene-epoch

Christensen, H. (1924). *Lærebok i farvning med planter.* Cappelen. https://doi.org/oai:nb.bibsys.no:990118325254702202 URN:NBN

Coccia, E. (2018). *The life of plants: A metaphysics of mixture.* Polity Press.

Cohut, M. (February 23, 2020). *Lyme disease treatment: 2 herbal compounds may beat antibiotics.* Medical News Today. https://www.medicalnewstoday.com/articles/lyme-disease-treatment-2-herbal-compounds-may-beat-antibiotics

Conard, N. J., & Rots, V. (2024). *Rope making in the Aurignacian of Central Europe more than 35,000 years ago. Science Advances, 10(5),* eadh5217. https://doi.org/10.1126/sciadv.adh5217

Council on Ethics for the Government Pension Fund Global. (n.d.). *Council on Ethics.* Retrieved May 23, 2024, from https://etikkradet.no/en/

Crawford, M. (2012). *Edible perennials: 50 top perennial plants from plants for a future.* Permanent Publications.

Crawford, M. (2012). *Edible trees: 50 top perennial plants from plants for a future.* Permanent Publications.

Crawford, M. (2013). *Edible shrubs: 50 top perennial plants from plants for a future.* Permanent Publications.

Danielsen, D. I. (2018, October 17). *Large interdisciplinary project to teach us about the Vikings' use of plants.* [In Norwegian: Stort tverrfaglig prosjekt skal lære oss om vikingenes plantebruk]. UiO Naturhistorisk museum. Retrieved from https://www.nhm.uio.no/om/aktuelle-saker/arkiv/2018/1016-prosjekt-om-vikingenes-plantebruk

Deleuze, G., & Guattari, F. (1987). *A thousand plateaus: Capitalism and schizophrenia* (B. Massumi, Trans.). University of Minnesota Press. (Original work published 1980).

Dennis, A. (2022). *Invasive Apothecary.* Retrieved 2024/05/01 from https://ecliptaherbal.com/invasive-apothecary

Doble, R. (2021). *The crucial importance of basket weaving technology for the world's first civilizations.* https://doi.org/10.13140/RG.2.2.10400.51203

Dunne, A., & Raby, F. (2013). *Speculative everything: Design, fiction, and social dreaming.* MIT Press.

Dunn, J. (2015). *Lab technician 'battered wife to death with a perfume bottle then killed himself after being driven mad by invading Japanese knotweed.* Daily Mail Online. Retrieved May 3, 2024, from https://www.dailymail.co.uk/news/article-3271083/Lab-technician-battered-wife-death-perfume-bottle-killed-driven-mad-invading-Japanese-knotweed-not-stopped.html

Elven, R., Hegre, H., Solstad, H., Pedersen, O., Pedersen, P. A., Åsen, P. A., & Vandvik, V. (2018). *Reynoutria japonica, ecological risk assessment.* [In Norwegian: Reynoutria japonica, vurdering av økologisk risiko]. Artsdatabanken. Retrieved April 14, 2023, from https://www.artsdatabanken.no/Fab2018/N/1130

FN-sambandet. (2022). *BNP per innbygger, for å måle velstandsnivået i et land.* FN.no. Retrieved from https://fn.no/Statistikk/bnp-per-innbygger

Frayling, C. (1993). *Research in art and design. Royal College of Art Research Papers*, 1(1), 1-5.

Geissdoerfer, M., Savaget, P., Bocken, N. M. P., & Hultink, E. J. (2017). *The Circular Economy - A new sustainability paradigm? Journal of Cleaner Production, 143,* 757-768. https://doi.org/10.1016/j.jclepro.2016.12.048

Gibbons, E. (1962). *Stalking the wild asparagus.* Alan C Hood & Company.

Gorjanc, M., Kert, M., Mujadžic, A., Simoncic, B., Tavcer, P., Tomsic, B., & Kostajnšek, K. (2019). *Cationic pretreatment of cotton and dyeing with Fallopia japonica leaves.* Tekstilec, 62, 181-186. https://doi.org/10.14502/Tekstilec2019.62.181-186

Hartigan, Jr. J. (2017). *Care of the species: Races of corn and the science of plant biodiversity.* University of Minnesota Press. Retrieved from ProQuest Ebook Central: http://ebookcentral.proquest.com/lib/utxa/detail.action?docID=5061182

Herer, J. (2000). *The emperor wears no clothes.* Quick American Archives.

Hiebert, H. (2006). *Papermaking with garden plants & common weeds.* Storey Publishing.

Holmgren, D. (2002). *Permaculture: Principles and pathways beyond sustainability.* Holmgren Design Services.

Hughes, K. (2021). *Climate change - Impacts and mitigation in the cotton sector.* Bremen Cotton Exchange. Retrieved from https://neu.baumwollboerse.de/en/2021/06/22/climate-change-impacts-and-mitigation-in-the-cotton-sector/

Ingolf, T. (2000). *The perception of the environment: Essays on livelihood, dwelling and skill.* Routledge.

Irwin, T. (2011). *Living systems theory and its relevance to design: A matrix.* Developed for the 2011 AIGA Conference, Phoenix. Retrieved from https://www.academia.edu/6076107/Living_Systems_Theory_Relevance_to_Design

Irwin, T. (2015). *Transition design: A proposal for a new area of design practice, study, and research. Design and Culture*, April, 229-246. https://doi.org/10.1080/17547075.2015.1051829

Irwin, T. (2018). *The emerging transition design approach.* *Design Management Academy. https://doi.org/10.21606/dma.2017.210

Karimah, A., Ridho, M. R., Munawar, S. S., Ismadi, Amin, Y., Damayanti, R., Lubis, M. A. R., et al. (2021). *A comprehensive review on natural fibers: Technological and socio-economical aspects.* Polymers, 13(24), 4280. MDPI AG. https://doi.org/10.3390/polym13244280

Kimmerer, R. W. (2013). *Braiding sweetgrass: Indigenous wisdom, scientific knowledge, and the teachings of plants.* Milkweed Editions.

Klancnik, M. (2021). *Screen printing with natural dye extract from Japanese knotweed rhizome.* Fibers and Polymers, 22(9), https://doi.org/10.1007/s12221-021-0955-4

Latour, B. (1999). O*n recalling ANT. The Sociological Review Monograph.* Retrieved from http://www.bruno-latour.fr/sites/default/files/P-77-RECALLING-ANT-GB.pdf

Latour, B. (2005). *Reassembling the social: An introduction to actor-network-theory.* Oxford University Press.

Latour, B. (2017). *Facing Gaia: Eight lectures on the new climatic regime*. Polity Press.

Latour, B. (2018). *Down to Earth: Politics in the new climatic regime.* Polity Press.

Lenzing AG. (n.d.). *Lenzing.* Retrieved May 16, 2024, from https://www.lenzing.com

Logan, J. (2018). *Make ink - A forager's guide to natural inkmaking.* Abrams.

Lovelock, J. E. (1979). *Gaia: A new look at life on Earth.* Oxford University Press.

Lowe, S., Browne, M., Boudjelas, S., & De Poorter, M. (2000). *100 of the world's worst invasive alien species: A selection from the global invasive species database.* The Invasive Species Specialist Group (ISSG) of the Species Survival Commission (SSC) of the World Conservation Union (IUCN). Retrieved from https://portals.iucn.org/library/sites/library/files/documents/2000-126.pdf

Lukešová, H., Palau, A. S., & Holst, B. (2017). *Identifying plant fibre textiles from Norwegian Merovingian Period and Viking Age graves: The Late Iron Age Collection of the University Museum of Bergen.* Journal of Archaeological Science: Reports, 13, 281-285. https://doi.org/10.1016/j.jasrep.2017.03.051

Lukešová, H., Andersen, H. L., Kolínová, M., & Holst, B. (2018). *Is it hop? Identifying hop fibres in a European historical context*. Archaeometry, 61(2). https://doi.org/10.1111/arcm.12437

Macfarlane, R., & Morris, J. (2017). *The lost words*. Hamish Hamilton at Penguin.

Magnussen, K., Westberg, N. B., Blaalid, R., & Vassvik, L. (2020). *Kostnader og nytte ved tiltak mot fremmede karplanter - en oppsummering* [Costs and benefits of measures against alien vascular plants - a summary](Menon-publikasjon nr. 117/2020 M-1795|2020). Menon Economics.

Malpass, M. (2019). *Critical design in context: History, theory, and practice.* Bloomsbury Visual Arts.

Malterud, N. (2012). *Artistic research - necessary and challenging.* Nordic Journal of Art and Research. Originally published in Norwegian in InFormation, 1/2012, and translated into English by Bergen Academy of Art and Design.

Matskogen Landås. (n.d.). *The Food Forest Landås* [In Norwegian: Matskogen Landås]. Retrieved May 23, 2024, from https://www.matskogenlandas.no

Memon, H., Hu, D., Wu, L., Wang, Y., Yao, J., Militky, J., Kremenakova, D., & Zhu, G. (2024). *Structure, properties, and fabric applicability of sustainable paper yarn with high washing stabi-*

lity. Heliyon, 10(5), e27467. https://doi.org/10.1016/j.heliyon.2024.e27467

Mertens, D. M. (2015). *Research and evaluation in education and psychology: Integrating diversity with quantitative, qualitative, and mixed methods*. SAGE Publications.

Miller, J. G. (1978). *Living systems.* McGraw-Hill.

Miljødirektoratet. (n.d.). *Invasive Species* [Norwegian Title: Fremmede arter]. Retrieved from https://www.miljodirektoratet.no/ansvarsomrader/arter-naturtyper/fremmede-arter/

Myrvoll, B. (n.d.). *Bent Erik Myrvoll.* Retrieved May 21, 2024, from http://www.bentmyrvoll.com

Napper, I. E., Wright, L. S., Barrett, A. C., Parker-Jurd, F. N. F., & Thompson, R. C. (2022). *Potential microplastic release from the maritime industry: Abrasion of rope. Science of the Total Environment*, 804, 150155. https://doi.org/10.1016/j.scitotenv.2021.150155.

NHM (2013, November 18). *Vikinghagen.* Natural History Museum, Oslo. Retrieved from https://www.nhm.uio.no/besok-oss/botanisk-hage/avdelinger/vikinghagen/

Nuñez, M. A., August, T., Bacher, S., Stoett, P., Vandvik, V., & Meyerson, L. A. (2024). *Including a diverse set of voices to address biological invasions.* Scientific Life, 39(5), 409-412. https://doi.org/10.1016/j.tree.2024.02.009

Orion, T. (2015). *Beyond the war on invasive species: A permaculture approach to ecosystem restoration.* Chelsea Green Publishing.

Oxman, N. (2016). *Material ecology.* MIT Media Lab. Retrieved from https://www.media.mit.edu

Pallasmaa, J. (2009). *The thinking hand: Existential and embodied wisdom in architecture.* Wiley.

Pavid, K. (2020, January 20). *What is the Anthropocene and why does it matter?* Natural History Museum. Retrieved from https://www.nhm.ac.uk/discover/what-is-the-anthropocene.html

Recker, K. (2020). *True colors: World masters of natural dyes and pigments.* Thrums Books.

Regenesis Group. (n.d.). *Regenesis: Regenerative development and design.* Retrieved from https://regenesisgroup.com

Rudd, M. (2014, July 13). *The plant that ate Britain.* The Sunday Times Magazine.

Sandvik, P. T. (2020). *Hvordan kom Norge ut av fattigdommen? Norgeshistorie,* Universitetet i Oslo. Retrieved from https://www.norgeshistorie.no/industrialisering-og-demokrati/1561_hvordan-kom-norge-ut-av-fattigdommen-.html

Schau, M. (2011, June 3). *Do you have this in your garden? It must go!* [Original title in Norwegian: Har du disse i hagen? De må bort! Helt vanlige hageplanter er svartelistet i Norge]. NRK. Retrieved from https://www.nrk.no/livsstil/har-du-disse-i-hagen_-de-ma-bort_-1.7659186

Schjølberg, E. (1988). C*ordage and similar products from Bryggen in Bergen. In The Bryggen Papers,* Supplementary Series 3, pp. 126, 134. Norwegian University Press. ISBN 8200077292. Retrieved from https://www.nb.no/items/URN:NBN:no-nb_digibok_2015120306008?page=109

Shaw, R. H. (2009). *The life history and host range of the Japanese knotweed psyllid, Aphalara itadori Shinji: Potentially the first classical biological weed control agent for the European Union.* Biological Control, 49(2), 105-113. https://doi.org/10.1016/j.biocontrol.2009.01.016

Skoglund, G., Holst, B., & Lukesova, H. (2020). *First experimental evidence of hop fibres in historical textiles.* Archaeological and Anthropological Sciences. https://doi.org/10.1007/s12520-020-01171-6

Spinnova. (n.d.). *Spinnova*. Retrieved May 15, 2024, from https://spinnova.com

Stenberg, M. A. J. (2024, January 2). *Nye tider for ein gammal slager.* NRK. Retrieved from https://www.nrk.no/mr/reipslagar-sarah-sjogreen-lagar-tau-pa-den-restaurerte-reiperbana-i-brunsvika-kristiansund-1.16693237

Støstad, M. N., Mon, S. T., & Solvang, R. (2024, January 6). *Norge i rødt, hvitt og grått.* NRK.

Retrieved from https://www.nrk.no/dokumentar/x1/nrk-avslorer_-44.000-inngrep-i-norsk-natur-pa-femar-1.16573560

Tessem, L. B. (2015, July 4). *The Vikings' green legacy bursting with life and knowledge.* [In Norwegian: Vikingenes grønne arv strutter av liv og lære]. Aftenposten. Retrieved from https://www.aftenposten.no/norge/i/wEK7M/Vikingenes-gronne-arv-strutter-av-liv-og-lare

Tharp, B. M., & Tharp, S. M. (2009, January 5). *The 4 fields of industrial design:* (No, not furniture, trans, consumer electronics, & toys). Core77. Retrieved from https://www.core77.com/posts/12226/The-4-Fields-of-Industrial-Design-No-not-furniture-trans-consumer-electronics-toys

Tharp, B., & Tharp, S. (2018). *Discursive design: Critical speculative, and alternative things*. MIT Press.

The Norwegian Crafts Institute [Handverksinstituttet]. (n.d.). *Bent Erik Myrvoll - Kalkmaler.* Retrieved from https://handverksinstituttet.no/stipendiater/tidligere-stipendiater/bent-erik-myrvoll-kalkmaler

Tsing, A. L., Deger, J., Saxena, A. K., & Zhou, F. (2024). *Field guide to the patchy Anthropocene*. Stanford University Press.

UDK Berlin. (n.d.). *Zertifikatskurs Ausstellungsdesign.* Berlin Career College. Retrieved May 14, 2024, from https://www.udk-berlin.de/universitaet/berlin-career-college/zertifikatskurs-ausstellungsdesign/

UNEP. (2021). *Making peace with nature: A scientific blueprint to tackle the climate, biodiversity and pollution emergencies* (978-92-807-3837-7). United Nations Environment Programme. Retrieved from https://www.unep.org/resources/making-peace-nature

University of Bergen. (n.d.). *Vigdis Vandvik*. Retrieved May 23, 2024, from https://www.uib.no/personer/Vigdis.Vandvik

Vassenden, E. (2013). *What is critical reflection? A question concerning artistic research, genre and the exercise of making narratives about one's own work*. Norwegian Artistic Research Programme. Retrieved from http://artisticresearch.no/wp-content/uploads/2012/09/What-is-critical-reflection.pdf, p. 31-32

Voora, V., Bermúdez, S., Larrea, C., Farrell, J., & Luna, E. (2022). *Cotton prices and sustainability. Global Market Report.* IISD. Retrieved from https://www.iisd.org/system/files/2023-01/2023-global-market-report-cotton.pdf

Watts, J. (2018, November 3). *Stop biodiversity loss or we could face our own extinction, warns UN.* The Guardian. Retrieved from https://www.theguardian.com/environment/2018/nov/03/stop-biodiversity-loss-or-we-could-face-our-own-extinction-warns-un

Wilhelmsen, S. E. (2022). *Plants out of place? A design-driven investigation of colour and material possibilities within a group of "invasive alien plant species" in a Norwegian context.* In A. Siniscalco (Ed.), Colour and Colorimetry. Multidisciplinary Contributions (Vol. XVII A). Gruppo del Colore - Associazione Italiana Colore. https://doi.org/10.23738/RCASB.006

Wilhelmsen, S. E. (2023). *Fieldnotes from the "Forbidden Garden"*, BioColours, Aalto University Press

Wilhelmsen, S. E. (n.d.). *About*. Siren Elise Wilhelmsen Studio. Retrieved May 23, 2024, from http://www.sirenelisewilhelmsen.com/about

WWF Verdens Naturfond. (n.d.). *Norges overforbruksdag*. Retrieved from https://www.wwf.no/klima-og-energi/norges-overforbruksdag

Zecchi. (n.d.). *Zecchi - Colors and equipment for fine arts*. Retrieved May 21, 2024, from http://www.zecchi.it

Zero Waste International Alliance. (n.d.). *Zero Waste.* Retrieved from https://zwia.org/zero-waste-definition/

Errata for
"Odd New Spring"

Refleksjonsdelen
"Towards Evolving
Landscapes and a
Reorientation in Design
Practice"

Siren Elise Wilhelmsen

Philosophiae doctor (ph.d.) i kunstnerisk utviklingsarbeid
ved Universitetet i Bergen

26.08.24 (dato sign. kandidat)

28.8.24 (dato sign. fakultet)

Errataliste for Ph.d. Prosjektet *Odd New Spring* (Refleksjonsdel)

Siren Elise Wilhelmsen

26.august 2024

Forkortelser for type rettelser:

1. Typografiske feil (Typo):Feilskriving, manglende eller feilaktige tegnsettinger, feil bruk av stor og liten bokstav.
2. Grammatiske feil (Gramm): Feil relatert til grammatikk, som feil bruk av tider, bøyninger eller setningsstruktur.
3. Stavefeil (Spelling): Feil stavemåte av ord.
4. Formatering (Format): Feil i formatering, som i skrifttype, størrelse, oppsett eller nummerering.
5. Referansefeil (Ref): Feil i referanser, som manglende referanse, feil sitering, eller feilaktig referanseinformasjon.
6. Figurfeil (Fig): Feil i figurer/bilder, som feil i bildetekster, eller feil data.
7. Språklige feil (Lang):Generelle feil i språkbruken, som uklarhet, dårlig formulering, eller tvetydigheter.

Nr	Side/ Kolonne/ Linje	Type	Originaltekst	Korrigert tekst
1	5/1/2-4	(Typo): Sett tittel i kursiv	Odd New Spring: Towards…	*Odd New Spring: Towards…*
2	5/1/13	(Typo): Sett tittel i kursiv	Odd New Spring	*Odd New Spring*
3	5/1/30	(Typo): Sett latinsk navn i kursiv og parentes	Fallopia japonica	*(Fallopia japonica)*
4	5/2/19	(Ref): Fjerne parentes og innhold	(Fig.1)	
5	5/2/31	(Ref): Fjerne parentes og innhold	(Fig.2)	
6	5/2/32 - 6/1/2	(Format): Sett latinske navn i parentes og kursiv (gjelder avsnittet)	Large-leaved Lupine, Lupinus polyphyllus, Yellow Loosestrife, Lysimachia punctata…	Large-leaved Lupine (*Lupinus polyphyllus*), Yellow Loosestrife (*Lysimachia punctata*)…
7	6/1/30	(Typo): Sett inn punktum	sustainability	sustainability.
8	6/1/31	(Typo): Erstatte uttrykkenes anførselstegn med kursiv	'artistic result' … 'reflection component'	*artistic result… reflection component*
9	6/2/3-16	(Format): Formatering til blokksitat	This reflection component shall "be documented in the form…"	(Linjeskift) (Innrykk) This reflection component shall be documented in the form… (Linjeskift)
10	6/2/37-38	(Typo): Erstatte anførselstegn med kursiv, samt korrigere bruk av store og små bokstaver	"The conflict of the faculties: Perspectives on artistic research and academia	*The Conflict of the Faculties: Perspectives on Artistic Research and Academia*
11	6/2/38	(Ref): Flytte referanse i teksten	words.[7]"	words."[7]
12	9/1/3	(Typo): Sett inn kolon	Photo	Photo:
13	12/2/6	(Lang): Korrigere oversettelse	Research Days	Science Days
14	12/2/27	(Typo): Fjerne bindestrek	Bent-Erik	Bent Erik
15	17/2/12	(Format): Innrykk	The wealth	(Innrykk) The wealth
16	18/1/10	(Format): Innrykk	The Norwegian	(Innrykk) The Norwegian
17	18/1/2	(Gramm) Manglende ord	…from being dependent what…	…from being dependent on what…
18	19/1/17, 22, 30 19/2/1	(Format): Fjern kursiv	*Material culture*	Material culture
19	19/2/3	(Typo): Fjerne anførselstegn	"material culture"	material culture
20	19/1/22 78/2/40 78/2/46 114/2/43	(Spell): Korreksjon fra amerikansk-engelsk til britisk-engelsk stavemåte ("z" til "s")	utilize	utilise
21				
22	19/1/39 21/1/11	(Typo): Manglende parantes og endre stor forbokstav i "In"	Design In Context	Design (in) Context
23	21/1/31	(Lang): Slette ordet "also"	The sub-studies also each contain…	The sub-studies each contain..
24	21/1/39-41	(Lang): Fjerne dobbel setning (gjentakelse)	Through the conversations…	
25	21/2/35	(Typo): Erstatte "and" med komma	process and artistic choices and…	process, artistic choices and…
26	22/1/21	(Gramm): Sette tittel i kursiv, og flytte ordet "list"	Although on the "world's top 100 worst invasive species list",	Although on the list *100 of the world's worst invasive alien species,*
27	22/2/16	(Spelling): Feil ord	it´s	is
28	24/0/22	(Ref): Erstatte norsk tekst med engelsk oversettelse	FN sambandet holder oversikt over BNP per innbygger, for å måle velstandsnivået i et land. Siste måling er fra 2022, og rangerer Norge på en andre plass på verdensbasis	The UN association keeps track of GDP per capita, to measure the level of prosperity in a country. The latest measurement is from 2022, and ranks Norway in second place worldwide
29	24/0/25	(Ref): Inkludere engelsk oversettelse av tititel	*Utslippsfordelingen*	*Utslippsfordelingen* [The distribution of emissions]
30	28/1/44 29/2/41	(Typo) : Fjern kursiv	*Extended Field of Design*	Extended Field of Design
31	28/2/1	(Typo): Erstatt anførselstegn med kursiv	"A Reorientation"	*A Reorientation*
32	28/2/6	(Typo): Fra kursiv til anførselstegn, samt sette inn kolon	…with the sentence, *There are professions…*	…with the sentence: "There are professions…"
33	28/2/20	(Lang): Slette ord, samt fjerne kursiv	*Extended Field of Design Framework*	Extended Field of Design

34	29/2/24 78/1/33	(Spell): Korreksjon fra amerikansk-engelsk til britisk-engelsk stavemåte ("z" til "s")	utilizing	utilising
35	29/2/25 33/2/47	(Spell): Korreksjon fra amerikansk-engelsk til britisk-engelsk stavemåte ("z" til "s")	recognizing	recognising
36	29/2/41	(Gramm): Feil bøyning	expand	expanded
37	29/1/4-9	(Format): Formateringsendring til blokksitat	Mari said: *The first problem…*	Mari said: (Linjeskrift og innrykk) The first problem… (Linjeskrift)
38	29/2/43	(Format): Erstatte kursiv med anførselstegn (i sitatet), samt sette inn komma (før sitatet og etter "Core 77")	In an interview with Core 77 Bruce and Stephanie Tharp state that *Without a compelling…*	In an interview with Core 77, Bruce and Stephanie Tharp state that, "Without a compelling…"
39	30/1/10 30/2/12 31/2/19	(Format): Fjern kursiv	*Four Fields of Design Framework*	Four Fields of Design Framework
40	30/1/19	(Spell): Erstatte feilaktig ord	diagram	framework
41	30/2/8	(Typo): Sette inn anførselstegn	score	"score"
42	30/2/21	(Typo): Fjerne kursiv	*Human x Nature Manifesto*	Human x Nature Manifesto
43	30/2/30-36	(Typo): Erstatte kursiv med anførselstegn	Here the material is leading the design process: *The field …*	Here the material is leading the design process: "The field…"
44	30/2/44	(Typo): Endre feilaktig bruk av store bokstaver og sette i kursiv	NATURE X HUMANITY	*Nature x Humanity*
45	31/2/15	(Format): Fjerne anførselstegn	"shift in mindset"	shift in mindset
46	31/2/30	(Format): Fjerne kursiv og korrigere preposisjon	*shift of mindset*	shift in mindset
47	33/1/27	(Typo): Fra anførselstegn til kursiv	“Artistic Research”	*Artistic Research*
48	33/1/41	(Typo): Bruk kursiv	through	*through*
49	33/2/32	(Spell): Korreksjon fra amerikansk-engelsk til britisk-engelsk stavemåte ("z" til "s")	emphasizes	emphasises
50	33/2/37	(Typo): Korriger store bokstaver	Material Cultures	material cultures
51	34/1/11 35/1/37	(Typo): Korriger stor bokstav	Principles	principles
52	34/1/15	(Lang): Sette inn manglende ord "that"	A method runs like	A method that runs like
53	34/1/31	(Typo): Fra anførselstegn til kursiv	“A Thousand Plateaus”	*A Thousand Plateaus*
54	34/1/33	(Ref): Manglende sluttnote-referanse i teksten	principles were defined:	principles were defined: 26
55	34/2/26 35/1/8	(Typo): Bruk store forbokstaver	rhizomatic thinking	Rhizomatic Thinking
56	34/2/44	(Gramm): Feil bøyning	become	became
57	35/1/38	(Typo): Sett inn komma	future yet	future, yet
58	35/1/45	(Typo): Sett inn manglende ord "a"	develop project	develop a project
59	35/2/45-46	(Format): Fjerne dobbelt linjeskift	directly with them. (linjeskift) (linjeskift) Mapping and Analysing	directly with them. (linjeskift) Mapping and Analysing
60	36/1/9	(Lang): Sett inn manglende ord "from" og flytte komma	In order to present a representative amount of data, collected stories a data graphic has been developed.	In order to present a representative amount of data from the collected stories, a data graphic has been developed.
61	36/2/5	(Spelling): Sett inn manglende bokstav	ieldwork:	Fieldwork:
62	37/1/12	(Typo): Fjerne anførselstegn	“Exhibition Design"	Exhibition Design
63	37/1/38	(Ref): Fra blå til sort farge på lenke	www.oddnewspring.com	www.oddnewspring.com
64	38/0/2-4	(Fig): Stryk fotokreditering	Photo: Siren Elise Wilhelmsen	
65	42/0/33	(Ref): Sluttnote mangler kildehenvisning (legges også til i *Bibliography* , s.261)		Cappuccio, S. (2010). *Bioregionalism as a new development paradigm. Papers on Territorial Intelligence and Culture of Development* . ENTI, Salerno.
66	43/29	(Ref): Skrive med store forbokstaver	*A thousand plateaus: Capitalism and schizophrenia*	*A Thousand Plateaus: Capitalism and Schizophreni*
67	45/1/22	(Format): Erstatte kursiv med komma og anførselstegn	he writes *Plants require nothing …*	he writes, "Plants require nothing…"
68	45/2/5	(Lang): Stryke gjentakelse	Twenty thousand years ago years ago,	Twenty thousand years ago,
69	45/2/13	(Lang): Inkludere full titel på prosjekt	*People and plants*	*People and Plants – Rediscovering and safeguarding Nordic ethnobothanical heritage*
70	45/2/26-33	(Format): Formateringsendring til blokksitat	has vanished to a great degree. *It is, in fact, reasonable to assume…*	has vanished to a great degree. (Linjeskrift) (Innrykk) It is, in fact, reasonable to assume… (Linjeskrift)
71	45/2/35- 46/1/1	(Typo): Erstatte kursiv med anførselstegn i sitat	by *children being …*	by "children being…"
72	46/1/5	(Lang): Korrigere tittel	*Lost words*	*The lost Words*
73	46/1/7	(Typo): Erstatte kolon og kursiv med komma og anførselstegn i sitat	As he says: *It is not…*	As he says, "It is not…"

74	47/1/43 49/2/4 50/1/44 50/2/5	(Lang): Bruk forkortelse	Norwegian Biodiversity Information Centre	NBIC
75	47/2/17	(Typo): Erstatte enkelt anførselstegn med dobbelt	'scoping document'	"scoping document"
76	47/2/18	(Lang): Slett gjentakende ord "alien species"	in the report on alien species, we compiled all available knowledge about alien species	in the report, we compiled all available knowledge about alien species
77	48/1/45	(Lang): Slett feil ord "it"	to use it.	to use.
78	48/2/2	(Lang): Skriv med små bokstaver	"Biological Invasions,"	"biological invasions,"
79	49/1/25	(Lang): Slett ord "or"	more or receptive	more receptive
80	49/2/1	(Lang): Slett ord "Yes, so"	Yes, so one thing is	One thing is
81	49/2/40	(Lang): Slett spørsmål "doesn't it?"	Yes, it raises tremendously significant questions, doesn't it?	Yes, it raises tremendously significant questions.
82	50/1/1	(Typo): Fjerne anførselstegn	"Nemaslug"	Nemaslug
83	50/1/2-3	(Typo): Fjerne anførselstegn, bruk kursiv på latinsk navn	"Spanish slug" (Arion vulgaris)	Spanish slug (*Arion vulgaris*)
84	50/1/8	(Format): Innrykk	Some	(Innrykk) Some
85	50/1/18	(Typo): Bruke anførselstegn	some cowboy behaviour	some "cowboy behaviour"
86	50/2/17	(Typo): Slett komma	humpback salmon, (*Oncorhynchus gorbuscha*)	humpback salmon (*Oncorhynchus gorbuscha*)
87	51/1/15-16	(Lang): Slett gjentakende ord "also"	Also, the use of perennials instead of annual plants is also good for the climate.	Also, the use of perennials instead of annual plants is good for the climate.
88	51/2/3	(Typo): Slett punktum	from. nature.	from nature.
89	51/2/20	(Lang): Sett inn manglende ord	*bonds to the surroundings*	*bonds to the living surroundings*
90	52/1/35	(Typo): Sette i kursiv	Nomen est Omen	*Nomen est Omen*
91	52/2/19	(Lang): Korriger ulkar setning	to visually represent the breadth of stories at a glance.	to visually represent the breadth of the stories at one glance.
92	53/1/4	(Typo): Fjerne anførselstegn	The "Flags":	The Flags:
93	53/1/18	(Lang): Korrigere uklar setning	emphasizing the importance of these new narratives; their historical and cultural significance.	emphasising the importance of their historical and cultural significance.
94	53/1/19	(Gram): korrigere setning ("Textile" og "metaphor" og komma)	Textile can serve as a metaphor for collected data as both involve	Textiles can serve as metaphors for collected data, as both involve
95	53/2/14 53/2/17 53/2/20 53/2/31	(Typo): Stor bokstav	presentation	Presentation
96	53/2/34 53/2/36	(Typo): Stor bokstav	exhibition	Exhibition
97	53/2/27	(Typo): Bruk kursiv	Cotoneaster bullatus	*Cotoneaster bullatus*
98	53/2/28	(Lang): Korrigere navn	Food Forest at Landås	Landås Food Forest
99	53/2/35	(Typo): Stor bokstav	park	Park
100	53/2/37	(Spell): Korrigere navn	Pristine	Presteigne
101	58/0/1	(Fig): Korrigere navn	*the textile workshop, KMD*	*KMD Textile workshop*
102	59/0/1	(Fig): Slett anførselstegn og komma	`Flags´,	Flags
103	59/0/1	(Fig): Korrigere navn og plassering	*Plants Communitas*	(linjeskift) *Plant Communitas*
104	70/0/1	(Fig): Inkludere engelsk oversettelse for klarhet	Bærekraftige Liv Landås	Bærekraftige Liv Landås [Sustainable Living at Landås]
105	70/0/2	(Fig): Korrigere oversettelse	Research Days	Science Days
106	70/0/3	(Fig): Liten forbokstav	Plants	plants
107	70/0/3	(Fig): Korrigere navn	Presenting for Botanical Association	Presenting for The Norwegian Botanical Associatio
108	71/0/1	(Fig): Erstatte norsk med engelsk oversettelse	Dugnad i Matskogen på Landås	Volunteer work in Matskogen på Landås [Landås Food Forest]
109	71/0/2	(Fig): Bruk kursiv	Metamorfose	*Metamorfose*
110	71/0/2	(Fig): Erstatte anførselstegn med kursiv	"How to interview a Plant?"	*How to interview a Plant?*
111	71/0/2	(Fig): Bruk kursiv	Material Lab 1	*Material Lab 1*
112	71/0/3	(Fig): Bruk kursiv	Plant Communitas	*Plant Communitas*
113	71/0/3	(Fig): Inkludere oversettelse til Engelsk	Matskogen på Landås	Matskogen på Landås [Landås Food Forest]
114	72/0/7	(Lang): Forenkle setning for tydelighet	Plants are organisms that primarily engage	Plants engage
115	72/0/8	(Ref): Manglende referering (til eksisterende kilde)	such as movement or complex responses to stimuli.	such as movement or complex responses to stimuli (Ref. Emanuele Coccia).
116	72/0/25	(Ref) Legge til manglende informasjon i URL		html
117	72/0/27	(Lang): Skrive om for presisering (bedre valg av engelske ord)	for desirable traits	for their qualities

118	72/0/28	(Lang): Forenkle setning for tydelighet	This process typically involves a series of intentional actions over generations, including seed selection, propagation, and cultivation, eventually leading to the development of domesticated plant varieties that differ significantly from their wild ancestors.	Caused by intentional actions through generations and plant varieties that differ significantly from their wild ancestors.
119	75/1/1-3	(Lang): Skrive om setning for riktig gramatikk og referanse	This chapter is devoted to my childhood "jungle plant", Japanese knotweed (ref. Introduction: "my grandmother's garden").	This chapter is devoted to Japanese knotweed, my childhood "jungle plant" (ref. *Introduction*)
120	75/1/14	(Typo): Erstatte parentes med hakeparenteser	( )	[ ]
121	75/1/16	(Typo): Bruke anførselstegn	the new flora	"the new flora"
122	75/1/17	(Lang): Erstatte komma med "and"	security, alternative	security and alternative
123	75/1/25	(Typo): Flytte parentes og komma , og sette latinske navn i kursiv	Japanese knotweed, Fallopia japonica (synonyms Fallopia reynoutria and Polygonum cuspidatum)	Japanese knotweed (*Fallopia japonica* , synonyms *Fallopia reynoutria* and *Polygonum cuspidatum*)
124	76/1/2	(Typo): Erstatte anførselstegn med kursiv	"The Plant..."	*The Plant...*
125	76/1/2-3	(Typo): Erstatte anførselstegn med kursiv	"Lab technician..."	*Lab technician...*
126	76/1/17	(Typo): Fjerne anførselstegn, bruke stor bokstav	"roundup"	Roundup
127	76/1/46	(Typo): Bruke kursiv, parentes, og skrive med stor forbokstav	aphalara itadori	*(Aphalara Itadori)*
128	76/2/19-20	(Typo): Erstatte anførselstegn med kursiv	"The Work of..."	*The Work of...*
129	77/1/4-5	(Typo): Erstatte anførselstegn med kursiv og stor bokstav	"how to interview..."	*How to interview...*
130	77/1/47	(Lang): Fjerne overflødig ord	a	
131	77/2/10	(Typo): Sette i kursiv	fire blight	*fire blight*
132	77/2/27	(Gram): Bytte preposisjon for riktig betoning	of	by
133	78/1/33	(Lang): Fjerne overflødig ord	but	
134	78/2/5	(Format): Innrykk	A concrete	(innrykk) A concrete
135	78/2/9	(Lang): Fra siffer til ord	5 to 10	five to ten
136	78/2/14 115/2/19	(Spell): Korreksjon fra amerikansk-engelsk til britisk-engelsk stavemåte ("z" til "s")	industrialization	industrialisation
137	79/1/19	(Lang): Bytte ord for å tydeliggjøre	before	previously
138	79/2/8	(Spell): Fjerne overflødig ord og komma, starte neste ord med stor bokstav	Yes, several	Several
139	79/2/14	(Typo): fjerne anførselstegn	"The Alliance for..."	The Alliance for...
140	79/2/24	(Lang): fra tall til ord	3	three
141	80/1/7	(Format): Innrykk	Several	(Innrykk) Several
142	80/1/15	(Lang): Sett inn manglende ord	without	without us
143	80/1/27-33	(Typo): Sette latinske navn i kursiv	(Symphytum officinale), apple (Malus domestica)...	(*Symphytum officinale*), apple (*Malus domestica*)...
144	80/2/34	(Typo): Sette latinske navn i kursiv	Lyme borreliosis	*Lyme borreliosis*
145	80/2/44	(Lang): Erstatte ord for tydelighet	but also	and
146	81/2/8 109/40	(Typo): Erstatte anførselstegn med kursiv	"Utopia for realists"	*Utopia for realists*
147	81/2/24	(Lang): Sett inn manglende ord	Exhibition	Solo exhibition
148	81/2/26	(Typo): Bruk stor bokstav	presentation	Presentation
149	81/2/27	(Lang): Korrigere navn	Research Days	Science Days
150	81/2/27	(Typo): Fjerne anførselstegn, skriv med stor bokstav	*"weed pavilion"*	*Weed Pavilion*
151	83/0/1	(Fig/ Spell): Korrigere ord	*Materials*	*Material*
152	84/0/1	(Fig/ Lang): Slett	Part of	
153	84/0/2	(Fig/ Spell): Korrigere navn	L´Orange	L´orange
154	87/0/1	(Fig/ Typo): Sett inn kolon	Photo	Photo:
155	88/0/1	(Fig/ Spell): Korriger ord	pre-veawing	pre-weaving
156	88/0/2	(Fig/ Spell): Korriger navn	TextileLab KMD	KMD Textile workshop
157	89/0/1	(Fig/ Spell): Korriger ord	veawing	weaving
158	89/0/2	(Fig/ Spell): Korriger navn	textiles workshop, KMD	KMD Textile workshop
159	89/0/6	(Fig/ Typo): Sett inn kolon	Photo	Photo:
160	90/0/2	(Fig/ Format): Linjeskift og liten forbokstav	*Japonica* , Joy	*japonica* , (linjeskift) Joy
161	95/0/2	(Fig/ Format): Linjeskift	*japonica* , Joy	*japonica* , (linjeskift) Joy
162	97/0/1 99/0/1	(Fig/ Typo): Kursiv og liten forbokstav	Interpreting Fallopia Japonica	*Interpreting Fallopia japonica*

163	97/0/1 99/0/1	(Fig/ Typo): Fjerne parantes	(2019)	2019
164	100/0/1 101/0/1 103/0/1 104/0/1 106/0/1	(Bildetekst): Erstatte anførselstegn med kursiv og komma	”Fellesuroen”	*Fellesuroen,*
165	108/0/26	(Lang): Forenkle for klarhet	a specific enzyme pathway (the shikimic acid pathway), which is essential for plant growth.	a specific enzyme pathway, essential for plant growth.
166	109/0/17	(Lang): Bytte ord for presist språk	A sample	An excerpt
167	111/1/7	(Typo): Sette inn bindestrek	"colour making"	"colour-making"
168	111/2/31	(Lang): Sett inn manglende ord	*what development*	*what the development*
169	112/1/19	(Lang): Sett inn manglende ord	that high	that the high
170	112/1/28	(Ref): flytte sluttnote 5 (resulterer i at den blir nr 4)	113/1/15: Blaafarveværket 5	112/1/28: Blaafarveværket 4
171	112/1/47	(Ref): Korrigere nummer på fotnote 4 (samt korrigere plassering i sluttnote-listen, side 130	4	5
172	112/2/16	(Typo): Sette punktum og stor bokstav	for example, geologists	for example. Geologists
173	112/2/16	(Lang): Presisering	it	that this formation
174	113/2/32	(Gram): Korrigere verbform	have work	have worked
175	113/2/42	(Gram): Korrigere verb	perform	offer
176	115/1/22	(Lang): unngå gjentakelse ("yes")	Yes, if	If
177	115/2/5-6	(Typo): Sette latinske navn i kursiv	(Rubia tinctorum)…(Isatis tinctoria)	(*Rubia tinctorum*)…(*Isatis tinctoria*)
178	115/2/27	(Format): Innrykk	Collecting	(innrykk) Collecting
179	115/2/34	(Typo): Erstatte enkelt anførselstegn med dobbelt	`colour hunts´	"colour hunts"
180	116/2/20	(Lang): Slette ord	a	
181	116/2/32	(Lang): Erstatte ord for presisering	design	interior
182	122/1	(Typo): Bruk kursiv	Colour hunt	*Colour hunt*
183	126/1	(Typo): Bruk stor bokstav	lupine	Lupine
184	133/1/1	(Ref): Slette parentes og innhold	(4)	
185	134/1/10	(Lang): Unngå gjentakelse	utilized	used
186	116/1/28 134/1/20 135/1/18 141/1/22	(Spell): Korreksjon fra amerikansk-engelsk til britisk-engelsk stavemåte ("z" til "s")	utilization	utilisation
187	134/1/25	(Spell): Korreksjon fra amerikansk-engelsk til britisk-engelsk stavemåte ("z" til "s")	strategize	strategise
188	134/1/26	(Lang): Unngå gjentakelse	utilization	management
189	134/1/39	(Spell): Korreksjon fra amerikansk-engelsk til britisk-engelsk stavemåte ("z" til "s")	utilizing	utilising
190	134/2/18	(Typ): Erstatte anførselstegn med kursiv	”Braiding Sweetgrass”	*Braiding Sweetgrass*
191	134/2/38	(Lang): Slette ord	and	
192	134/2/38	(Lang): unngå gjentakelse	utilizing	making use of
193	135/1/39	(Typo): Slette komma	storage, and	storage and
194	135/1/42	(Format): Innrykk	What	(innrykk) What
195	135/2/2	(Format): Innrykk	Another	(innrykk) Another
196	135/2/26	(Spell): Korreksjon fra US til UK engelsk ("z"/"s")	specialize	specialise
197	136/1/19	(Typo): Bruke anførselstegn	love knot	"love knot"
198	136/1/33	(Spell): Korreksjon fra US til UK engelsk ("z"/"s")	specialized	specialised
199	137/1/13	(Typo): Fjerne gjennomstryk	. (gjennomstrøket)	.
200	137/2/5	(Lang): Bytte ord for riktig betoning	to do	who does
201	137/2/14	(Lang): Sett inn manglende ord "it"	order from	order it from
202	137/2/20	(Typo): Slett komma	economically, and	economically and
203	137/2/43	(Lang): Bytte ord for riktig betydning	fetched	gathered
204	139/1/29	(Typo): Erstatte anførselstegn med kursiv	”Fibrous Futures”	*Fibrous Futures*
205	139/1/41	(Spell): Korreksjon fra amerikansk-engelsk til britisk-engelsk stavemåte ("z" til "s")	utilized	utilised
206	139/2/22	(Lang): Forenkle setning for tydelighet	Wickerwork refers to the process of weaving pliable	Wickerwork is weaving pliable
207	139/2/24	(Lang): Forenkle setning for tydelighet	to create items like	to make
208	139/2/24	(Typo): Slett komma	baskets, and	baskets and

209	139/2/40-41	(Typo): Bruk kursiv i latinske navn	(Cytisus scoparius) ... (Cornus sericea)	(*Cytisus scoparius*) ... (*Cornus sericea*)
210	140/1/4	(Typo): Erstatte anførselstegn med kursiv, stor bokstav i Liv	"Planteliv"	*PlanteLiv*
211	140/1/15	(Format): Innrykk	Over	(innrykk) Over
212	140/1/36	(Format): Innrykk	These	(innrykk) These
213	140/1/37-38	(Typo): Erstatte anførselstegn med kursiv	"Papermaking with ..."	*Papermaking with* ...
214	140/2/18	(Format): Innrykk	While	(innrykk) While
215	140/2/32	(Format): Innrykk	A third	(innrykk) A third
216	141/1/7	(Gramm): Korrigere pronomen	they	we
217	141/1/13	(Gramm): Bruk forkortelse	Invasive Alien Plant Species (IAPS)	IAPS
218	141/1/24	(Format): Innrykk	When	(Innrykk) When
219	141/1/24	(Gramm): Endre til flertall	material	materials
220	141/2/8	(Lang): Sette inn manglende ord	how Living	how the Living
221	141/2/33	(Lang) Slett parentes og innhold	(Oxman)	
222	142/1/19	(Format): Innrykk	Where	(Innrykk) Where
223	144/1/3	(Lang): Sett inn manglende ord	traditions, new	traditions, and new
224	144/1/4	(Gramm): Erstatte komma med "and"	materials, resources.	materials and resources
225	144/1/20	(Typo): Stor bokstav	conference	Conference
226	144/1/23	(Typo): Stor bokstav	seminar and workshop	Seminar and Workshop
227	144/1/29	(Typo): Stor bokstav	workshop	Workshop
228	144/1/29	(Typo): Slette anførselstegn og komma, bruk kursiv	"PlanteLiv",	*PlanteLiv* –
229	144/1/30	(Typo): Stor bokstav	*making*	*Making*
230	144/1/32	(Typo): fFerne anførselstegn	"Gjenbruksuken"	Gjenbruksuken
231	161/0/1	(Fig/ Spell): Sett inn manglende bokstav	Lupin	Lupine
232	165/2/12	(Typo): Fjerne komma	speculations, and	speculations and
233	165/2/22	(Lang): Korrigere antall	sixteen	seventeen
234	165/2/29	(Typo): Fjerne bindestrek	Bent-Erik	Bent Erik
235	166/1/29	(Lang): Erstatte ord for klarhet	materials	textiles
236	166/1/29	(Lang): Erstatte ord for klarhet	coloured	dyed
237	166/1/33	(Spell): Sett inn manglende bokstav, og stor forbokstav	lupin	Lupine
238	166/1/36	(Spell): Sett inn manglende bokstav, og stor forbokstav	lupin	Lupine
239	166/2/2	(Gramm): Korrigering av verbtempus	are currently	were
240	166/2/34	(Lang): Sett inn manglende ord	balances conforming	balances between conforming
241	166/2/36	(Lang): erstatte komma med "and"	space (and, by extension, science), break	space (and, by extension, science) and break
242	166/2/36	(Gramm): Korrigering av verb	break	breaking
243	166/2/38 166/2/44	(Typo): Fjerne anførselstegn	"flags"	flags
244	166/2/45	(Gramm): Korrigere verbform	is	are
245	166/2/47	(Format): Slett linjeskift	exhibits. (linjeskift) All	exhibits. All
246	166/2/47	(Lang): Bytte ord for riktig betoning	them	these
247	166/2/47	(Spell): Korreksjon fra amerikansk-engelsk til britisk-engelsk stavemåte ("z" til "s")	materialize	materialise
248	167/1/1	(Typo): Slette komma	foundation, and	foundation and
249	167/1/20	(Lang): Bytte ord for riktig betoning	see them from a new perspective	take a new perspective
250	167/1/29	(Lang): Sette inn manglende ord	their materials work	their material properties work
251	168/1/25	(Format): Fjerne anførselstegn	*"Odd New Spring"*	*Odd New Spring*
252	168/1/28	(Lang): Bytte ord for riktig betoning	and	as well as
253	168/2/27-32	(Typo): Erstatte anførselstegn med kursiv	"The Settlers: Domestic ..."	*The Settlers: Domestic* ...
254	168/2/36-38	(Typo): Erstatte anførselstegn med kursiv	"Odd New Spring..."	*Odd New Spring*...
255	168/2/44	(Spell): Sette inn manglende bokstav	uture	Future
256	169/1/6	(Typo): Fjerne komma	research, my	research my
257	169/2/3	(Format): Innrykk	The	(Innrykk) The
258	169/2/11	(Lang): Slett	with the public	
259	174 -203	(Fig/ Typo): Fjerne anførselstegn og kursiv	*`Flag´, 2024*	Flag, 2024
260	204-205	(Fig/ Typo): Fjerne anførselstegn og kursiv	*`Matrix´, 2024*	Matrix, 2024
261	206 -208	(Fig/ Typo): Fjerne kursiv	*Experimental material proposals, 2024*	Experimental material proposals, 2024
262	218	(Fig. Foto): Oppdatere bilde	4 bilder fra vitrinene	samme motiv, men tatt etter vitrinen ble endret (endringen skjedde før bedømmelse)


thank you