Graduation Plan

Master of Science Architecture, Urbanism & Building Sciences

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Graduation Plan: All tracks

Submit your Graduation Plan to the Board of Examiners (Examencommissie-BK@tudelft.nl), Mentors and Delegate of the Board of Examiners one week before P2 at the latest.

The graduation plan consists of at least the following data/segments:

Personal information	
Name	**Alexander Scho**
Student number	4915003
Telephone number	
Private e-mail address	

Studio		
Name / Theme	Transitional Territories / North Sea: Landscapes of Coexistence	
Main mentor	Jacques Vink	Design
Second mentor	Sjap Holst	Building Technology
Third mentor	Taneha K. Bacchin	Research
Argumentation of choice of the studio	I have always been interested in diverse scales and believe in challenging myself to step out of my comfort zone is the key to professional development. I have an opinion about what architecture is and what kind of roll I want to play within the profession, which is a lot about the expression of form. Still there is this interest about the scientific research based side of the profession of it which I wanted to work with in my final master project. To take the broader picture into account on how architecture can influence society, economics and such, is what triggered me the most to choose an interdisciplinary studio, together with urbanists. I also found it fascinating how the proposed research of the territorial scale of the North Sea would eventually develop into an, at that time, uncertain project.	

Graduation project	
Title of the graduation project	Food Matters
Goal	
Location:	Netherlands, Dordrecht
The posed problem,	The North Sea is currently in an over nutritioned state. These high doses of nitrogen and phosphates one can specially find along the Dutch and German coast line lead to eutrophication, meaning low level of oxygen in the Sea. This process transforms the whole mari-

	time flora and fauna. Thereby its important to say that the nitrogen emissions might be 300 times a harmful as CO2 according to the SDG Report from the UN in 2019. Also important to notice is that agriculture is responsible for 60% of the global Nitrogen emissions. The Netherlands are the 2nd biggest exporter for food in the world and almost two thirds of the Dutch land is used for agricultural purposes. With the Farmersprotest one can see the first political tense situations resolving from this situation. Dutch farmers, which are constrained to a highly efficient form of agriculture, having to much by-products to safely put back into the natural cycle and are thereby forced to over nutrient the water-system and eventually the North Sea. But not just the cattle farmers which use 62% of the agricultural land are highly efficient in pollution their environment, also the other big share of 31% monoculture does a lot of harm to the environment with high doses of fertilizer and pesticides to guarantee their margins. Mostly the cattle is feed with Soybean Meal imported from Brazil and Argentina to the Netherlands. From 2010 till 2017 this was ~4,6 billion Dollar worth of Soybean Meal from Argentina and ~11,2 billion Dollar from Brazil. Apart from the greenhouse gas emissions resulting into CO2 and NOx in the atmosphere from shipping there is an ethical dilemma with the current practice of burning the rainforest along the Amazonas in Brazil. As previously touched, all these imbalances result from a state of controlling every square meter on this planet, we are entering the Anthropocene. To tackle the urgencies displayed in the Planetary Boundaries Research the anthropogenic impact on the physical space has to be smaller and in balance. One could say, considering agriculture as cultivated land, that the Netherlands, under an Ecomodernist understanding, has only 12% natural space. Mostly these issues are related to agriculture, specially the meat production. Technology in Agriculture is currently in the process of complete detachment from natural processes. Crops can grow without soil and sunlight in containers and Meat can be grown in incubators. Those advancements have the potential to change land use, pollution and the food metabolism drastically. But therefore their potential has to be researched, tested and explored, also from a spatial point of view. But current political phenomenon display that there is a high risk of unacceptable by society for these technologies.
research questions and	How will future technologies of food production potentially transform the agricultural space of the Green Heart and how can this shifted space be beneficial with tackling the urgencies displayed in the planetary boundaries diagram, specially the Biochemical Flows? How does the architecture of these future technologies potentially

	look like and how can it contribute to their acceptance in society?
design assignment in which these result.	Designing a clean meat and vegetable factory on the edge of the Green Heart of the Netherlands, the center of cattle farming, and the urban center of Dordrecht. The site also sits on the edge of the in the future proposebly most vulnerable area of the Netherlands to flooding. The design will be a prototype with the potential to growth, to tackle the problem stated before. Thereby special attention will be laying on the metabolism behind the production and how to embed the new industry within the context of an area in urban transition. Also how to architecturally address the vulnerability of an unacceptance by society.

[This should be formulated in such a way that the graduation project can answer these questions.
The definition of the problem has to be significant to a clearly defined area of research and design.]

Process

Method description

Literature Study, Mapping Current State, Mapping Projections, Scenario Planning, Reference Analysis, Site Visit, Research by Design

Literature and general practical preference

An Ecomodernist Manifesto, accessed January 9, 2020, http://www.ecomodernism.org/manifesto-english

Koel von Mensvoort, *Next Nature: Nature Changes Along with Us*, (Barcelona: Actar, 2011)

Yuval Noah Harari, *Sapiens: A Brief History of Humankind*, (New York: Harper, 2011)

Michael Pye, *The Edge of the World: How the North Sea Made Us Who We Are*, (Amsterdam: Pegasus Books, 2014)

Reflection

1. What is the relation between your graduation (project) topic, the studio topic (if applicable), your master track (A,U,BT,LA,MBE), and your master programme (MSc AUBS)?

My graduation topic is a very recent one, the Nitrogen topic in the academic discourse came up around 2009 in the Planetary Boundaries Research. Claiming that the biochemical flows of Nitrogen and Phosphates are already beyond uncertain outcome which bring along high risks for the environment. These environmental concerns are closely related to environmental urbanism, which is sort of the core believe of the Transitional Territories studio. To the North Sea topic its obviously related since those flows are measurable in the Sea, in simple amounts of gram/litre or state of eutrophication.

Architecturally its interesting since the practice of clean meat production and vertical farming is is rather a biological or agricultural science topic. But to root both within an existing context, address its cultural, natural, social or any other urban measure makes its quite architectural. Also the question about how to make the whole production process experienceable for the public to not alienise the practice is an architectural question.

2. What is the relevance of your graduation work in the larger social, professional and scientific framework.

The project is relevant to the architectural scientific world, because the technologies I've been talking about have the potential to bring the 4th Agricultural Revolution. This means that first of all they are as recent that there has not been an architectural scientific work about clean meat factories. Same goes for vertical farms, they are also as new that there is not much known or even researched about their implementation in the built environment. Another important reason for the relevance is the potential shift in land use, that these technologies could offer, which is directly connected to urbanisation.