WHAT'S ON THE TABLE IS WHAT'S EATEN.

A text seemingly about recalcitrant cows, vertical farms and unrecognisable future habitats for sapiens

Reflections by Daniel Podmirseg, Vienna August 25th 2023

The Romantic Trap

Too often it seems that efforts of parts of our society to draw attention to current challenges related to maintaining a habitable zone for us are leading to nowhere.

This may have to do with the level of complexity of our systems, which we are continuously developing. In systems theory terms, it is easy to answer the whole topic dystopically and declare that every system increases in complexity until it collapses. This is culturally and historically easy to prove.

Nevertheless, there is a large percentage of people who already see or even invented, tested or developed approaches to repair or correct, for parts, perhaps not of the system as a whole, but at least for one or more structural elements in it.

Whether or not we as a community can get a grip on the climate crisis, or if we have enough time to do so, should not play a role in the following considerations. Here the focus is on global agriculture, a system in which it is easy to list a multitude of committed human crimes in terms of climate change, water run-offs, oil consumption, destruction of nature, dissolution of biodiversity, species extinction and economic crimes - from distortion of competition to externalities, from modern slavery to unambitious misuse of taxpayers' money.

We do not want to go in depth into the above points here, but rather to draw a clearer picture of one of the greatest revolutions that Homo Sapiens have set in motion and one of the break-throughs that we are currently experiencing. Thought patterns from misunderstood romanticism or of nature, misunderstood ecology movements to religious, partly fundamentalist ones, stand in the way of everything that is necessary to turn it to the better.

That is why we now want to symbolically sacrifice the Austrian dairy cow grazing on alpine meadows that are bursting with biodiversity, whose freshly brushed ears are stroked by a mild spring breeze out of respect for its over a billion family members that we’re locking down, abusing and fattening up to the slaughter at this very moment.

Instead, we direct our eyes to where we come from, where we are, and where we want to go.

The domestication of Homo Sapiens

We are still part of nature. But with that the discussion about nature is closed once and for all. Here it's about cultural achievements. About 11,500 years ago, we assumed - step by step - that it might be wiser to grow food ourselves. From the initial 50.000 m^2 that a person needed to feed himself sufficiently before the Neolithic, we now need 2.300 m^2 per caput.

It is a fact that by observing and understanding seasons, temperature fluctuations, changing lighting conditions, the related succession of cultures and plant growth as well as the behaviour of wild animals, we copied, influenced, and changed parts of natural processes by producing thousands of cultivars of fruit, vegetables, grains and animals, nature has never seen before.

The Neolithic revolution can also be viewed dialectically. Regardless of whether we domesticated the wheat, or it domesticated us, it is an ambivalent success story that began for us back then. As hunter-gatherers, we had a far more diverse food basket until the 20th century. Primal wheat was just one of them. It is an extremely demanding wild grass species. Of all plants, it was the one we pounced on. The list of requirements for a happy and high-yielding wheat stalk is long, from extensive solar radiation to the right composition or ratio of water and nutrients. The latter should by no means be shared with other plants. And if there are too many stones in the soil, the expected harvest, which is essential for survival - once a year - is considerably impaired.

An incredibly large amount of work has thus been imposed on us by the transition from hunter-gatherer. Watering, weeding, tilling the soil, stooping, sweating, bending, pawing, crawling. An incredibly arduous physical activity the sapiens' body is not designed for. Not with the happy foresight of a bountiful supply for the meagre winter months ahead, but all in daily worry and psychological tension about it, comparable to the moment of the rolling ball on the roulette table.

Computing systems, language, administration, storage facilities, building typologies, legal systems and jurisdictions had to be co-developed in parallel, as what had been laboriously and sometimes agonisingly acquired had to be managed, defended, and distributed. Wheat has spread over an area equivalent to Algeria.

Farm animal husbandry did not begin with the stable, but with the protection of herds from predators other than humans and certainly from humans of other tribes, with the removal of recalcitrant, weaker, or older individuals. Whether they became tame because we intervened in evolution through selection or by being fed by us on a daily basis is irrelevant - both hypotheses are convincing. To feed all our farm animals today we need an area equivalent to two Australias. They represent 95% of the total mass of all mammals living in the world.

From mimic to meaning

Thus, in evolutionary terms, we can see the invention of agriculture as a stroke of luck for Homo Sapiens. At the beginning, according to various estimates, we were no more than 10,000,000 people on earth, concentrated on the northeast coast of South America, parts of Mexico and western North America, central Africa, the Levante and Turkey, Indonesia, and East Asia. We cracked the 8 billion mark this year. Therefor each of us feeds about 9 farm animals in this very moment while reading.

Biomimicry was the original impulse of humans. However, this conversion is no longer part of nature, but the birth of culture, it is the true opposite of it. Agriculture enabled us to become what we are today. They enabled us to develop the beautiful and enchanting aspects of life - to create meaning and value, ethics and activities beyond hunting and gathering, from art to music, from philosophy to science. It opened the way to the division of labour, which allowed everyone to search for his or her own individual meaning in life. So – while nearly every human on earth was busy with labour on the field, three, four or five percent filled up our history books. A relationship that has been reversing globally at an accelerating pace for the past century.

Since agriculture became more and more structurally coupled with industry, especially the oil- and armaments industries, agricultural production has completely changed not only in practice and scale, but also in its energy consumption patterns. From the Neolithic Revolution to the Green Revolution, the only sources of energy for food production were human labour and direct sunlight, which was then increasingly supplemented using electricity and, above all, fossil fuels, especially oil and gas.

In agricultural production in the last 150 years, we have made structural changes which are at the root of many of our problems. Before that time, we used to feed one and a half people with one hectare. Now it's almost seven. While the world's population has quadrupled, we have increased yields six-fold, but only doubled the agricultural land. Nevertheless, it is now equivalent to the area of South America, and the trend is rising sharply. This was possible with a fossil energy input increase of + 8,500%.

Too late to be a pessimist

The sensitisation of consumers to this issue brings food production into the daily press as a placeholder. Meat consumption, especially in industrialised countries, is stagnating or declining. Interest in farming conditions is increasing. Irrespective of reactionary or romanticising tendencies, enterprises have already established themselves that form important structural elements within the food value chain, create new sub-economic urban networks or strengthen existing ones. This refers to enterprises that have started to produce high quality food within the urban area with high nutritional content through guaranteed freshness, turning food waste and food losses into economic subjects, production sites in cultivation or processing up to packaging, partially closing energy- and material flows and approaching the principle of circular economy. All this in a distorted competitive environment, as these partial pioneering achievements are tied to corporate risk and cannot benefit, or can only benefit to a very small extent, from the largest budget item of the European Union – the financial framework for more of the same.

We also find plenty of true pioneers who have understood the city as a metabolism and have recognised answers to the galloping industrialisation or the distribution of functional structures in the city over spatially significant distances and have implemented solutions in demonstration projects. One company should be highlighted here: Ruthner IP (Industrieller Pflanzenbau). The Viennese company, founded by Oswald Ruthner, started with verticalized agriculture more than half a century ago. With people at the centre and understanding the city as an organism, a prototype was built in Langenlois, followed by a vertical farm (Phytotower) at the 1964 “Wiener Internationale Gartenschau” - with a building height of over 40 metres. This was followed by at least twenty projects worldwide, from Canada to Sweden, Egypt to Iran. The death of the inventor brought the company to an abrupt end.

Other Plant Factories and vertical farms with their innovative cultivation and production methods have been successfully implemented 50 years later in a rapidly growing market worldwide since 2009. The complexity of indoor food production as well as energy considerations and effective planning of material flows are enormous innovation drivers in research and development as well as the basis of new business models. From classical horticulture to software development, IT and IoT, from fish farms to robotics and automation, from livestock farming to AI and data analytics, from soil to in-vitro.

Unfortunately, these developments are still seen by key decision-makers as disruptive structural elements for a (lagging) agricultural system. This not only slows down the testing, implementation, and development of new structural elements for future resilient cities that wants to provide answers to the challenges mentioned above, it also fails to recognise firstly true pioneer’s work and subsequently the need and demand to bring transparency in general back into the food value chain.

Procrastination and fascination

Currently, the food value chain accounts for about one third of primary energy demand globally. Production, washing, processing, packaging, to name just a few elements, are linked via transport and supported by large-volume storage and cold storage facilities with all its fossil fuel consumptions. The implosion of the food value chain creates positive externalities. With every square metre of food production on land already sealed, we leave somewhere at least 120 m^2 of the remaining natural area with all its services to the world. This is the design task, it must be visualized and made transparent. The translation of structural elements into spatial experiences, facilitate an understanding and fascination for the essence of the Neolithic Revolution.

Transparency in this context must be seen from two perspectives: First, in the consumer's ability to establish contact with the producer again and the spatial presence of the imploded food value chain between and from sweating to masticating by making all structural units of the food value chain visible.

Visualisation, perception, and experience leads to understanding. There is an exploding pool of examples of successful implementations of urban- and/ or vertical farming projects ready to inspire or waiting to be copied. Subsequently generating trust and impact. This is a call to free riders hopping up on frontrunner cities.

All these factors individually hold potential to counter not only climate change. The interplay of these creates synergy potentials and achieves an exponentially growing positive effect. Quantifiable and measurable. One of the strengths of Homo Sapiens is cooperation - beyond the tribal affiliation of 150 individuals. We have many systemic changes behind us. The re-integration of production into the urban environment right into the heart of the city, holds great potential to relieve the current agricultural system and make it more socially equitable. Get rid of the fear of complexity and stop the search for the seemingly simple solution.

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