

HAS IT ALREADY BEGUN?



Devised theatre-scientific performance focused on the global problem of ecological situation of our planet.

A summary of the scientific lectures used in the production.

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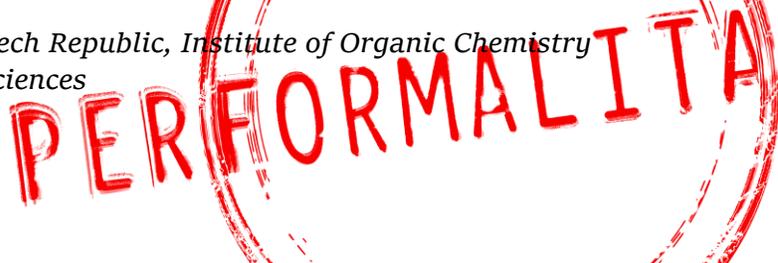
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ISSUE: Czech forests, bark beetle, aridity and human activity

Human activity, climate change and ever-growing areas of drying forests are closely related.

On the one hand, there is climate change that changes the precipitation in our climate. On the other hand, there is the human who started to sow spruce monocultures in altitude below 1000 metres some 100-150 years ago. Under 1000 metres; that is, in an environment where spruce does not normally vegetate.

Climate change and an insufficiently diverse environment of forest monocultures creates ideal conditions for bark beetle infestations. The Bark beetle procreates usually once up to twice a year, but in ideal conditions for overgrowth caused by warmer winters and especially by hot summers, the procreation may take place up to four times a year.

The bark beetle usually attacks only trees that are in bad conditions, old, or fallen, but due to overgrowth, it also attacks entirely healthy spruces which are unable to defend themselves sufficiently because they are sown in an environment that is inappropriate for them. With this, instead of defending themselves against the bark beetle, they need to also fight aridity. This tiny insect also lives in symbiosis with many types of fungi and moulds and spreads them all throughout the tree to weaken the infested tree even further.

As a result, we get areas full of greyish, dry trees.

But that is not all. The decrease in healthy forest growth contributes to the alteration of the natural cycle of water. Trees can no longer take water from soil, keep it inside of them and later evaporate it into the air where it would normally turn into a cloud and return into the cycle in the form of rain. Healthy forests are, therefore, crucial for lowering the temperature of the local microclimate.

Large scale logging, aridity and alterations of the natural water cycle lead to the creation of empty plains which further accumulate heat and thus produce an unwelcoming environment. Although mother nature is very adaptive, every successful adaptation requires time. Destructive human activity is a very fast process with which a great deal of fauna and flora cannot keep up. This leads to an ever-faster decrease in biodiversity and gradual decay of nature as we have known it so far.

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ISSUE: A dropping number of insects and human activity

You may have noticed that the numbers of insects around you are dropping. The strongest factor at play in the decrease of insects is the change in their natural habitats. This is a direct consequence of human activity based on the extreme exploitation of landscapes as well as excessive use of pesticides and fertilisers.

Insects represent over two thirds of all existent fauna found on Earth. Even though a decrease in the population of insects may not seem to be a fatal problem, it is important to realise that everything on Earth is interconnected and that insects keep the food chain – part of which are also humans – in balance. At the same time, insects are indispensable pollinators, some species even produce invaluable commodities such as honey or silk, and then there are the very useful insectivore insects, which prevent the overpopulation of pest. Some play an important part in decomposing biomass and turning it into a reusable form of nitrogen – into hummus.

Biodiversity is crucial for the entire ecosystem of the planet and also for our human bodies. That's why disruptions in local biodiversity have a direct impact on our lives. It is also important to realise how our behaviour destroys natural processes that were developing for thousands of years...

...and whether the world we are creating now is one worth living in.

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ISSUE: Waste as a result of human activity

Every year, human activity produces approximately two billion tons of municipal solid waste. 3,7 million tons of waste was produced in 2018 in the Czech Republic, which translates into 350 kgs per capita. Countries with the biggest production of waste are USA, China and EU countries.

Urbanisation, ever-growing civic population and the consumer economy brings higher productions of waste. Often, it does not even occur to us how much waste is being produced by our society. The amount of waste produced is not even measured, the same applies for our consumption of water and gas. In many cases, waste processing is not even calculated into the price of the products that create the waste.

In cities, for example, we do not pay adequate attention to the amount of waste we produce. All that is yet made worse by exportation of the waste outside of the cities, states or even continents. Unfortunately, it is a common practice of developed countries to export their waste into Southeast Asia and China so the waste is never profoundly seen anywhere.

But putting the problem away from our sight is not going to make it disappear.

Waste produced by humanity releases a vast amount of toxins, especially from unrecycled batteries, fluorescent lamps, all electronic devices as well as from colourings and lacquers. When these get in contact with rainwater, these toxins get into the soil and, through that, get into groundwater, vitiating it.

Another problem lies in the amount of space needed for our waste's storage. According to the World Bank, up to 40% of all waste is being stored in illegal or non-regulated dumps, which is something practiced by nearly four billion people. Illegal dumps usually lead towards the intense destruction of the environment. However, not even legal dumps are a sustainable solution.

Dumps overfilled with unsorted waste do not allow for the safe decomposition of materials. That is why it is impossible to prevent common fires and the releasing of toxins into the environment. Unfortunately, these fires are often started on purpose, to burn the current waste and create more space for further waste. Over 300 fires are reported yearly in the Czech Republic, which translates to two to three fires per dump a year. Due to these fires, however, dioxins that are extremely toxic for their wide surroundings are released into the air together with vast amounts of CO₂.

The efficient elimination of waste is ensured by waste incineration plants. The problem is, though, that during this process, many valuable materials, especially paper and plastics, are lost. The root of the problem is inefficient waste sorting and a lack of recycling plants that could return used materials back into circulation. Yet recycling is not an ideal solution. Efficient recycling is energetically very demanding and requires building a complex infrastructure of specialised recycling plants. That is why it is crucial to prevent this process and use of throwaway packages or short-term goods.

The key problem that lies in waste is its very creation.

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ISSUE: Modern agriculture and food waste

Humankind produces 1.3 billion tons of food per year which then ends up uneaten - a third of the world's entire food production.

Food waste is not only a systemic issue – it's also personal, being caused by each and every one of us. The systemic aspect is present especially in developing countries, where means of conserving or treating food are often not sufficient, and therefore a large amount of food is not being consumed due to mould or rot. In more developed countries, it's the consumers' behavior and attitude causing food waste, then mainly restaurants and supermarkets – but still, it's especially us, the consumers. That's why it's important to reconsider our ways of buying food, as we often don't even think ahead about the amount of food we actually need and eat. It's also important to look for the origin of the food, as a large amount of food is being imported from the other side of the world, thus leaving an unbearably high carbon footprint. It's more favourable to connect with local farmers – but food waste is only a part of the food issue.

Food production itself is a major burden on the local ecosystem and involves using vast amounts of water, fertilisers and land. Approximately 130 litres of water is needed to produce one kilogram of lettuce like this. In contrast, 15,000 litres are needed to produce one kilogram of beef. One kilogram of milk chocolate even has a water footprint of 24,000 litres on average.

The use of various chemical fertilizers and pesticides is also a major burden. The downside of rapid production, which feeds the ever-growing population, is the degradation of the soil through the excessive use of fertilisers, rendering it unusable for several years due to the disturbance of the natural pH. Above-average fertilization causes nitrogen compounds and phosphates to escape from the soil and flush out into watercourses. This results in an overgrowth of algae and cyanobacteria, which begin to consume large amounts of oxygen to enable their decomposition, making life for other

fish or shellfish impossible as a result. However, birds and other animals depend on them, so the whole ecosystem is completely disturbed.

As with fertilisers, pesticides are flushed and have a destructive impact on local biodiversity, nonetheless. In addition to the pests against which they are intended, pesticides kill other insects and even small animals - mammals or birds - but also plants and all living organisms in the area.

By 2050, the number of the inhabitants on Earth will have increased by 2 billion. The paradox remains that in order to feed our population, we destroy the environment that provides us and other organisms with the vital resources we need to live.

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ISSUE: Fashion and the clothing industry

80 billion pieces of clothing is produced every year, which makes approximately 10 pieces per person per year. However, we must take into account the economic differences and the fact that some climate zones don't need seasonal clothing.

Most inhabitants of developed countries use only a quarter of the clothes stored in their wardrobes – and each of them throws away an average of 35 kilograms every year, only 15 % of the discarded clothing is recycled, as the majority of it ends up in landfills or incinerators.

The most widely used material in fast fashion, an industry offering low-quality clothing for short-term use is 100 % polyester - one could say that some clothes have almost the same material as a plastic bottle. More than half of our clothing contains these artificial materials, which are made from fossil resources. The ecological footprint is further enhanced by the fact that most clothing is made in China, Bangladesh or India, countries that are powered exclusively by coal. 10% of all global CO2 emissions come

from the clothing industry. Fashion is, after the oil industry, the second dirtiest industry in the world.

In most countries where fashion items are made, waste is flushed directly into watercourses. Such waste materials include highly toxic chlorinated anilines which are also present in aniline watercolours, for example. But it's not so much watercolours as tons of aniline dyes, which are used to dye most textiles and then discharged straight into the water, rivers and lakes. These waters are still being used for bathing and as a drinking water source for humans and other living creatures. At the same time, various plasticisers and other chemicals are released into the water, which improve the properties of man-made fibres - these substances have the effect of endocrine disruptors. This means that they affect hormones in the body or damage gender differentiation - so, for example, males develop female genitals.

Behind the glamorous fashion and clothing industry hides the shadow of destroyed nature. We must make up for the quick shift of trends by buying quality materials and updating our wardrobes in a sustainable way. Because if we buy 2 new pieces a month, that's 2.5 times the world average...

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ISSUE: Plastic

The most widely known plastic is a PET bottle. Made in seconds, used within minutes. Its decomposition will take centuries.

Plastics in general are very cheap and energy-efficient to manufacture. They have many great properties, they are light but durable, usable in the long-term, do not decompose in water, and are very easy to shape - hence their name, they are plastic. That is why they have replaced most other materials such as ceramics, glass or wood. One third of all plastics produced are packaging materials.

About half of all plastics produced in a year are eventually thrown away. To give you an idea, it's about 150 million tons. If all this plastic waste were recycled, approximately 3.5 billion barrels of oil would be saved.

To produce plastic materials, only approximately 4 % of fossil resources is being used. It's motor fuel, fuel oil and aviation fuel that requires the largest amount of crude oil. This 4 % is crucial, though, if we consider their negative effect on the environment. For example, PET or polyethylene terephthalate, the main chemical ingredient of plastic, is not itself toxic - that's the reason why it's used in drink containers. But the very moment when it becomes waste and stays in a landfill or in nature for a longer period, it starts to release toxic chemicals due to the effect of UV radiation or abrasives (for example the abrasive effect of sand, if the waste ends up in a sea). These toxic chemicals are then absorbed by their surroundings and have a negative effect on the ecosystem.

A major problem with plastic is its bare amount produced and the careless way we use it. Dubious quality of some plastics is compensated with devastating effects on the environment. Just like with food waste, it's important to recognize our personal responsibility and to reduce the amount of plastic we, as individuals, use - for example by reusing plastic bags when shopping for food, and especially by choosing products not packaged in layers of plastic that don't even have any actual use.

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Scientific texts included in this file are based on the screenplay of the original production *Has It Begun Already?*, created by the artistic collective Performalita in 2019/2020.

The premiere of *Has It Begun Already?* took place on 3rd of June, 2020, in Cross Attic, Prague.

The production was created within the international project *Rights for Kids*, which aims at spreading awareness about the Convention on the Rights of the Child. You can find out more about the project at www.rightsforkids.eu.

The creative process on the production was accompanied by parallel project called *Future & Ecology* (*Budoucnost & Ekologie*) that included artistic-scientific research on public activism in Czech Republic and Germany along with a residency stay at Chemnitz (KOMPLEX) with work-in-progress presentation of the new production



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