WUR from within: straight, sharp, transparent

No 01

Resource

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The journalism platform for all at Wageningen University & Research

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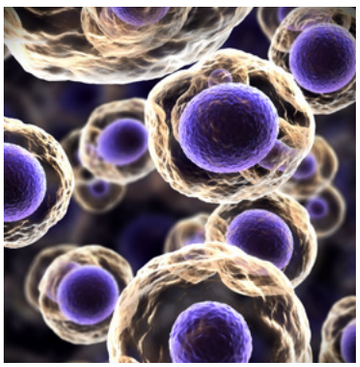

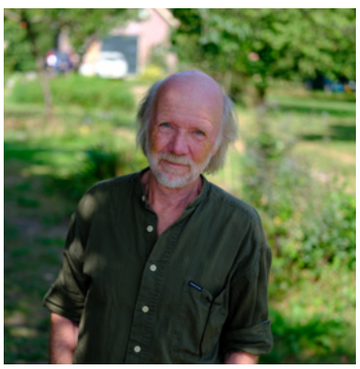

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FOREWORD

Look out

Were the three women in their early 20s who were sexually harassed by a man in the bus from Ede-Wageningen station last Sunday evening students? The police wouldn't say for privacy reasons, but it's far from impossible. You can just imagine it: three young women returning to uni on Sunday evening after a weekend with their families, just that final stretch by bus... And then events take a nasty turn and you spend the whole evening talking to the police, to point out your harasser, to report the assault and so on.

I don't know what happened exactly on that bus, how the other passengers reacted or what words the bus driver used to get the man off the bus. I only hope those women felt supported and didn't feel they had to deal with this alone. That might have made the nasty experience of that Sunday evening a bit less awful. In my experience, you don't easily forget a scary moment like that – this is also the experience of the people I spoke to for the article on page 12. Wageningen is a safe place on the whole, but it feels a lot safer when you can count on the support of the people around you. So my advice to all you Wageningen people is: look out for one another.

Marieke Enter
Resource science editor

Return of the swan

In recent years, Wageningen campus has regularly served as a home for one or more pairs of swans. They usually used the reeds on the east bank of the Forum pond as a place to brood. We would then be treated to the sight of cute little cygnets in the spring.
Two summers ago was the last time a pair of swans with their cygnets were seen on campus. Now one bird has returned. Swan couples stay together for life. So is this a widow, or perhaps one of the offspring? DV

Photo Guy Ackermans

Start to academic protest year

The official opening of the academic year on 1 September was also the day on which the 'academic protest year' started. 'This will be a critical year for the universities,' said the WUR campaign team. 'After the massive cuts of more than one billion euros introduced by the previous government, the Dutch will be voting in the Parliamentary election on 29 October. Investment in higher education and the reversal of those cuts won't automatically be on the political agenda — we need to campaign for this. If we don't act now, soon there won't be any more academic years to open.'
During the official opening, members of the campaign team handed out red squares to visitors entering the Omnia side entrance. At the main entrance, and later in the auditorium, Wageningen4Palestine activists demonstrated in protest at the event's theme, *Food for Health: What Really Works*. 'While WUR talks about solving food-related problems, it continues to collaborate with a state that uses starvation as a weapon against over two million innocent civilians,' said the demonstrators. ME/DV

Artwork applauds new PhDs

Each PhD candidate who receives their doctorate in Omnia will now get a round of applause and be bathed in light by the artwork *Light Applause*. The work by artist Mariska de Groot was commissioned by WUPodium (formerly WU-Genoten), an association of active and retired professors and their partners, for WUR's centenary in 2018. There were delays due to funding issues. The 'applause' is produced by the rhythmic sound of 100 (because of the centenary) wooden blocks drumming on a soundboard. RK

Far fewer new students

The number of preliminary registrations of new students at WUR is down by almost 10 per cent compared with last year. The final numbers are not yet known, but it is clear that far fewer students have chosen to come to Wageningen. The number of AID participants – another good indicator – was 16 per cent less than in 2024.

The decrease in preliminary registrations differs depending on the degree programme. Some, such as Biology and Marine Sciences, have seen numbers unchanged or even slightly higher. But the intake for other BSc degrees has fallen by a third or almost half. Economics & Policy and Plant Sciences have experienced the biggest percentage declines compared to the previous academic year, of between 40 and 45 per cent. The university's own forecasts had assumed a slight drop in the intake because of demographic developments (fewer school leavers) and because other universities are increasingly offering degrees in the traditional Wageningen domains. But the Dean of Education, Dick de Ridder, says the decline is more than expected. 'Fewer students also means less government funding,' he says. 'Coming on top of the cutbacks we already had to make, this could be a real challenge for the chair groups.'

Turning the tide

Nearly all the Dutch universities are expecting a drop in the intake, but that decrease seems to be more extreme in Wageningen than elsewhere. Eindhoven University of Technology has seen a similar decline in Dutch students but appears so far to be attracting more international students. De Ridder says WUR is working hard to turn the tide. He points for example to the portfolio analysis carried out last year, with a critical evaluation of the degrees on offer. 'We are also investing more energy in student recruitment. Perhaps we waited too long for this, but we have set everything in motion now.'

Indication

Preliminary registrations are not the same as the final numbers but they give a good indication of the trend. If a student registers with more than one university in the Netherlands, their registration is given a lower weighting: someone who registers for two degree programmes counts as half a registration, someone who registers for three degrees counts as a third and so on. The preliminary registrations of international students, who might also have applied to universities in other countries, are a less reliable indicator. The final intake numbers are expected to be published in October. LZ

On page 26: Is the falling intake a disaster or not?

100

The Brabant Student Guild (BSG) was founded 100 years ago. They celebrated their centenary with a 24-hour session of *rikken*, a Brabant card game. BSG member Rick Baats: 'We started and stopped at 11 minutes past 11, a reference to the Brabant tradition of carnival.' (The carnival season begins at that time on 11 November.) He also has a nice anecdote about the guild's origins, featuring a group of Brabant students, a car full of Brabant beer and a cellar. LZ

You can read it at resource-online.nl

Bioma on hold

Construction of Bioma, the new building for the Wageningen Microbiome Centre (WMC), may not go ahead after all. Building work was due to start this spring but has been postponed because of the high costs. According to the Executive Board, the bids for the contract were far higher than had been expected beforehand. Given the cutbacks, the decision has now been taken to review the situation. A working group will look again at what space is required and report back to the board at the end of the year. The plan was for nearly all WUR's microbiological research to be housed in the new WMC building Bioma, next to Axis. The current plan will definitely not be implemented, but it is uncertain whether there will be a new building at all. RK

New Gerrit Grijns fund

University Fund Wageningen (UFW) has set up a new themed fund aimed at stimulating research on healthy nutrition. The new fund is named after Gerrit Grijns, one of the founding fathers of modern nutrition theory. In the late 19th century, Grijns discovered how vitamins work.

Two of Gerrit Grijns' great-grandchildren are behind the new fund. According to UFW director Lies Boelrijk, one of their motives for setting it up was to make their ancestor's name better known. Six years ago, the Gerrit Grijns Initiative was established as a collaborative venture between the many chair groups within WUR that work on nutrition and health. 'There is definitely room for improvement in his name recognition,' says Boelrijk. 'Even in WUR, many people have never heard of Gerrit Grijns and only a few are aware of his significance.' The aim is to raise at least two million euros for the new fund over the next four years.

Photo Museum Boerhaave

Already a start

They already have the first quarter of a million, which was donated by one of the fund initiators. To raise the rest, UFW will make use for example of the contacts of the committee of recommendations that it is setting up. That committee will include former President of the Executive Board Louise Fresco and Global Nutrition professor Edith Feskens.
The fund organizers will work closely with the Grijns Initiative. According to Boelrijk, the scope is wider than just contributions to innovative research. 'Other possibilities are support for start-ups based on PhD research, and funding for lectures and symposiums or for an English translation of the book on Grijns' work, *De Vitaminepioniers*.' RK

A brochure with more information can be downloaded from the UFW website.

Survival uncertain after grant application rejected

FARM OF THE FUTURE NEEDS TO FIND MILLIONS

The survival of the Farm of the Future in Lelystad is at risk, according to the project website, following the rejection of a grant application. The project parties are looking for an alternative solution.

The Farm of the Future in Flevoland had funding up until July this year. To be able to continue, WUR and its partners had submitted a grant application to the Scheme for Experimental Locations. The application was rejected, though, because there were far too many applicants relative to the available funding. Only three of the 26 applicants could be given grants.
For the Farm of the Future to continue in its current form for the next five years, it needs about six million euros, of which five million will have to come from grants. If that amount cannot be secured by the end of the year, the plans will need to change drastically, and it could spell the end of the project. They have not reached that stage yet though, says project manager Pieter de Wolf. 'People in the region and the sector have told us they are shocked by the idea that an initiative of such strategic importance for the future of agriculture may have to stop. We hope parties will step up that are willing to contribute financially to help ensure the project's survival. But no single party has that kind of money lying around, so it may be a few months before we have clarity on the matter.'

Strip cropping on the Farm of the Future • Photo OANEvents

BEQUEST

The bequest of 2.5 million euros that the Farm of the Future received earlier this year will not be used for this. De Wolf: 'In principle, the bequest is intended to enable extra activities. People don't generally leave their money so as to close gaps in the regular project funding.'
The Netherlands Enterprise Agency had better news for the Southeast Sand Farm of the Future in Vredepeel (Limburg), a WUR project focusing on sustainable agricultural systems on sandy soil: their grant application under the Scheme for Experimental Locations *did* get approved. ME

Three WUR runners in trail championship

Two WUR students and a PhD candidate are competing in the world trail running championship from 25 to 28 September in the Spanish Pyrenees.
They are PhD candidate Renée Cardinaals (31), who is researching sustainable healthy diets, and Master's students Sara Dekker (23, Nutrition & Health) and Matthijs Karels (22, Governance of Sustainability Transformations). Dekker will run the 82-kilometre long trail (elevation gain of 5,400 metres), while her boyfriend Karels and Cardinaals will compete in the 'short' trail of 45 kilometres (3,650 metres elevation gain). 'It's my first major race,' says Dekker. 'The route is a lot more difficult than anything I have run before. But I think it's really cool to be able to run wearing the kit of the Netherlands. That is so special.'
Cardinaals is competing for the third time in a world championship. Last year, she came 11th in the European championship. She hopes now to end in the top 25. 'The standard is very high'. A total of 1,300 athletes are competing in the various events. LZ

Read more on resource-online.nl.

Photo Roelof Kleis

Fuga has to move

The artwork on the right of the main entrance to the campus can't stay exposed to the elements. *Fuga*, by the sculptor Ubbo Scheffer, is made from black marble and wood. But the wood is starting to rot and so the WUR Art Committee is looking for a new home for the sculpture. 'We would prefer to leave it outdoors but under a roof,' says Marijn Blok of the Art Committee. 'Then the general public can still see it.' Staff and students are invited to come up with suggestions for a new location. RK

Send your tips to resource@wur.nl.
For more about Fuga, see resource-online.nl

Cucumbers can't be tamed

Cucumber leaves grow up the plant in a spiral. That is a problem for cucumber-picking robots because the leaves get in the way. Might it be possible to modify the plants so that the leaves are neatly aligned along the stem? PhD candidate Merijn Kerstens now has the answer to that particular question. Namely, no.

Text Roelof Kleis • Illustration Shutterstock

In nature, growth often tends towards the spiral. The pattern of repeated leaves or flowers up a stalk is often at a rotation of exactly 137.5 degrees clockwise or anticlockwise. Thale cress, often studied as a model plant, also obeys the rule of the 'golden angle'. But not always. 'Occasionally there are mutants with an angle of 90 or 180 degrees,' says Kerstens.

He decided to investigate why mutants sometimes deviate from the normal spiral pattern, and to then attempt to introduce that property in cultivated cucumbers. He focused on the role of transcription factors in the mutated thale cress plants (with changes to the genes). Transcription factors are proteins that act as switches in the genome. When they bind to a gene, it can be activated or inhibited. Kerstens studied what are termed PLETHORAs, transcription factors that play a role in growth, pattern formation and cell division.

Utrecht

The first study of deviating angles in mutant thale cress plants took place in Utrecht. When those trials were repeated in Wageningen, the effect was much less clear. Kerstens: 'There was more variation in the angles, but I didn't find a clear pattern of 90-degree or 180-degree angles.' The mystery was solved in the end.

'As the thale cress grows, the stem twists anticlockwise slightly,' explains Kerstens. 'In addition, the mutant stems grow relatively slightly faster than the non-mutant plant. That means the distance between two successive flowers is slightly longer, and therefore the angle is slightly bigger for a stem that twists anticlockwise, or smaller if the stem twists clockwise.'

'The chance that you will be able to transfer the property of one plant to another is quite small'

The twisting stems lead to greater variation in the measured angles, but not in the same way as in Utrecht where this phenomenon was discovered. 'Apparently, the growth chambers in Utrecht have a different effect on the plants than ours in Radix,' concludes Kerstens. 'That might be due to differences in the lighting or air humidity.'

So training cucumbers to grow more conveniently seems to be a pipedream. 'Cucumber plants grow a metre per week, there is a big distance between two leaves and the stems twist a lot,' says Kerstens. In other words, it's a hopeless venture. 'That too is science. The chance that you will be able to transfer the property of one plant to another is quite small.'

But he does now know an awful lot more about the role of PLETHORA transcription factors and how they work. To function, they need to bind to specific genes. Kerstens found the sites where they bind. The associated genetic code also seems to be the same for a lot of plants. 'That's why I think their function is also similar for many plants.'

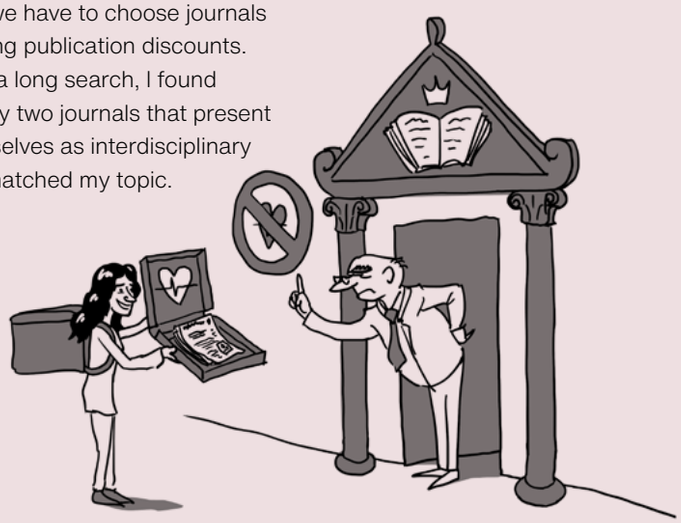
A botched experiment, a rejected paper: such things are soon labelled as failures in academia. As for talking about them — not done! But that is just what WUR scientists do in this column. Because failure has its uses. This time, it's Negar Nayeri, a Consumption & Healthy Lifestyles PhD candidate. Text Nicole van 't Wout Hofland • Illustration Stijn Schreven

'Conducting research at the intersection of several disciplines is valuable, but also brings its own difficulties. In my doctoral project, I use AI and data science to study how the online food environment, such as meal delivery platforms or social media, affect food availability and marketing. My work therefore sits right at the crossroads of computer science and health science.

'One reviewer dismissed the core concept of my research as "meaningless and poorly explained"'

'Recently, I encountered a typical interdisciplinary hurdle: publishing. I wrote a systematic review on how AI is being used to investigate the online food environment. The search for a suitable journal was a real struggle. Most academic journals focus on a single field or scope. Opportunities for publishing interdisciplinary work are limited, especially now that due to budget cuts we have to choose journals offering publication discounts. After a long search, I found exactly two journals that present themselves as interdisciplinary and matched my topic.

'I submitted my article to the journal with a focus on data science and public health. It made it through to the review stage. A few weeks later, the feedback arrived. I immediately scanned the message for that dreaded word "unfortunately". And there it was: "unfortunately this is not a paper on medical informatics". One reviewer dismissed the core concept of my research as "meaningless and poorly explained". To make matters worse, they misrepresented the study, as if I had developed a completely new AI system, when in fact I had used existing tools to sort the data. Their judgement was therefore based on misunderstandings. While I partly blame the reviewers' carelessness, the rejection still stung. Luckily, my supervisors supported me. They advised me not to focus solely on interdisciplinary journals, but also to consider where the papers in my reference list were published. That was a valuable tip which I am now following. Hopefully round two will go better.'



'Nutrition as medicine requires changes to food supply chain'

There is growing interest in using food products as medicine. What implications does that have for the way in which we produce food? That is the question professor by special appointment Thijs Defraeye (Food Quality & Design) is asking. His thoughts on the matter led to a review article that was published recently.

Food as medicine is one aspect of the up-and-coming field of lifestyle medicine, where healthy diets are used to prevent diseases and help make treatment more effective. Despite this, it is often assumed there is not much money for producers, for example, in nutrition for disease prevention. Defraeye wants to challenge that assumption. He believes there are opportunities for both existing firms and new enterprises.
The current food supply chain is set up to give consumers what they want to eat, explains Defraeye. If everyone switched tomorrow to diets in line with the dietary guidelines, there would probably not be enough produce to meet that demand. But history shows that scaling up production is indeed possible, he argues in the article.
If healthy food is to become widely available all year round, changes must be made in the associated infrastructure and processing. Processing methods such as drying or freezing can help. The healthy products also need to appeal to consumers, says Defraeye. That means healthy food needs to fit in the consumer's daily routine and be affordable.

Personalization

Defraeye also sees opportunities in the new market of personalized health services, for example with nutritional advice based on fitness activities recorded in an app or a smartwatch. However, he immediately adds a caveat: 'More research is needed on the impact of a data-driven, personalized diet as compared to a generally healthy diet.' DV

Preparing for fire

While southern Europe was fighting forest fires everywhere, the Netherlands had a fairly quiet summer in that respect. But that is no guarantee for the future. Far from it, shows research by Hugo Lambrechts: the number of days with high risk of fires will double by 2050.

Text Roelof Kleis

Lambrechts received a PhD last week for his thesis *Between Fire and Water*. In it, he advocates a new approach to fire safety. 'Wildfires are traditionally seen as something bad we have to protect the landscape from. We need to learn how to live with fire, just like we live with water. That's a new concept in the Netherlands.'

But not for Lambrechts personally. He is the son of South African ostrich farmers and grew up with the constant threat of forest fires. While he was at university in Cape Town, a fire destroyed a large part of his parents' farm. As a forest warden on plantations, he learned about all the aspects of preventing and fighting forest fires.

Lambrechts' PhD study shows how climate change will make it necessary to use a more broad-based, integrated approach in the Netherlands too. He calculated the number of days with a high risk of wildfires in the past, present and future. Those are days on which there are at least two wildfires.

Fire-proof landscapes

To perform the calculations, he used weather data and the wildfire database of his supervisor and fire expert Cathelijne Stoof. If temperatures increase by two degrees Celsius, the number of days with a risk of wildfires will double. There is a big difference between the northern and southern Netherlands. Maastricht will have the most high-risk days: 16. 'That is mainly due to the difference in climate,' says Lambrechts. 'It is often cooler in the northern provinces and the humidity is higher.'

Lambrechts advocates creating fire-proof landscapes to reduce the risk of wildfires.

Photo Shutterstock

'That means for example removing the fuel, in other words the dead material, or making the landscape wetter.'

'One of the measures I recommend is to plant more deciduous trees as they form a wetter microclimate,' he continues. 'Deciduous trees also have less undergrowth and therefore less fuel for the fires. That also makes firefighting easier and safer for the firemen.'

Controlled fires is another option for getting rid of the fuel and thereby preventing larger fires. 'The Ministry of Defence does that in areas where they carry out target practice. Or you can prune trees growing near residential areas to stop the branches functioning as ladders that let the fire climb to the crown and spread from there.'

'We need to learn how to live with fire, just like we live with water'

Fire boards

Lambrechts says an integrated approach to fire management requires more coordination than is currently the case. He recommends introducing 'fire boards', analogous to the water boards. He thinks the cooperation between the existing safety regions doesn't go far enough. 'Wildfires don't care about regional boundaries. Something that spans the safety regions is needed. You need someone coordinating the various organizations who also has the authority to take measures.'

PhD theses in a nutshell

Sleeping Beauty

Strawberry plants rest in the winter, like many other plants. The cold and the shorter days (less sunlight) keep them dormant. In spring, the sun kisses the strawberry plant to wake it up. Stephan David studied which genes are involved in dormancy. He found a few genes that seem to play key roles, but that is only the tip of the iceberg. The strawberry plant is not so easy to figure out. It's a mysterious fairy tale. RK

The regulation of winter dormancy in strawberry.

Stephan David ◀ Supervisor Leo Marcelis

Good bacterium

The gut bacterium *Akkermansia muciniphila* is thought to have significant health benefits. However, exactly how that works is still largely a mystery. Kate Ligthart showed that the bacterium makes the important neurotransmitter GABA in the acid conditions that prevail in the intestines. That could be the link between the bacterium and its influence on the brain. RK

Akkermansia muciniphila.

Kate Ligthart ◀ Supervisors Willem de Vos and Hauke Smidt

Healthy fish

Interferon plays an important role in the defence against viruses. Cornelius Gunter, from South Africa, studied the eight different interferon proteins in the immune system of the carp. The role in the immune system depends on the viral load, the temperature and the time elapsed since the start of the infection. He also found the genes that code for the receptors on the cell surface that bind the interferon and help trigger the defence mechanism. However, it did not prove possible to develop a vaccine for one important carp virus, which had initially been the aim of the study. RK

Molecular and functional characterisation of common carp interferon-phi and their receptors. **Cornelius Gunter ◀ Supervisor Maria Forlenza**

THE PROPOSITION

PhD candidates explain their most thought-provoking proposition. This time it's **Olga Schagen**, who received her PhD last May. Her research was on the role of circular initiatives in steering the transformation towards a circular bio-economy.
Text Ning Fan.

'In a circular society, rabbits are a more circular pet than cats or dogs'

'The inspiration for this proposition comes from Mala, my toilet-trained pet rabbit. When I'm cooking, she follows me into the kitchen, and I feed her the raw vegetable and fruit leftovers. One argument for this proposition is the far lower environmental footprint of a rabbit's vegan diet compared to the diet of cats and dogs.

'Moreover, rabbit produce "cold manure" – low in nitrogen and gentle on plants – which can be applied directly to gardens or houseplants without composting. In contrast, cat and dog waste can contain harmful pathogens and contaminate soil and water.

'Thirdly, flea treatments for cats and dogs typically contain chemicals. Some even contain fipronil and imidacloprid, which are banned in agriculture, and these insecticides can get into the soil and water when the cats and dogs are outdoors or go swimming. Rabbits require no such flea treatments.

'Finally, as herbivores – not predators – rabbits pose no threat to bird populations. In the Netherlands alone, cats kill an estimated 18 million birds each year.

'So, if you want a cuddly pet that supports a circular society, a rabbit is a better choice than a cat or dog! Just bear in mind that rabbits are social creatures. Keeping a pair is ideal, though toilet-training two free-range bunnies can be more challenging.'

Studying in the AI era

Sjoukje Osinga

There you are, a first-year student about to start university life. But why bother? After all, you can ask ChatGPT anything these days. You can use AI to do your assignments, create software programs or even write your thesis for you. If you did a literature study in the olden days, you had to go to the library and look up articles in scientific journals that you then had to copy on the spot. Then came Web of Science, which gave you access to vast amounts of literature while sitting at your desk. But you still had to read, summarize and categorize everything yourself. Now all you need is a carefully chosen prompt and you don't even have to do those tasks. You don't have to be able to write proper English anymore either.

'AI makes you cognitively lazy, so train your own brain while at university, not an AI'

So what's the point of your education? AI is going to take over your job anyway, according to the media. You can only be guaranteed a job in future if you work with your hands, for example as a roofer, or dredging, massaging or changing nappies. No one will want copywriters, programmers, consultants or content creators. Can you look forward to a career at all? Perhaps you should switch to a course for plumbers.

Don't fall for this narrative. There are still good reasons for doing a degree because a university education is about far more than the coursework. The network you build is invaluable and can't be simulated. AI knows a lot but it doesn't know what knowledge is appropriate for which situation. Wageningen students learn this: they are practical, acquire skills, find out about their domain. They are also nice people with broad interests — precisely what we will need in the future. What is more, AI consumes ridiculous amounts of energy so your behaviour is automatically climate-aware if you decide not to use it. But don't throw the baby out with the bathwater. There's nothing wrong with using AI appropriately, because that leaves you more time for creativity. AI learns by rehashing stuff but new discoveries still only come from humans. AI makes you cognitively lazy, so make sure that it's your own brain that you train at university, not an AI. And don't forget to pick your teachers' brains too, as they studied the old-fashioned way. Finally, AI is known for occasionally hallucinating, but hallucinating without AI is much more fun. And you can always play bullshit bingo with ChatGPT results.

Sjoukje Osinga (57) is an assistant professor of Information Technology. She sings alto in the Wageningen chamber choir Musica Vocale, has three sons who are students and enjoys birdwatching with her husband in the Binnenveldse Hooilanden.

RECLAIMING THE NIGHT

The Netherlands was shocked recently by four incidents of appalling violence against women in a single week. It led to a surge of anger and grief, but also to initiatives to make the streets safe again – and not just for (cis) women. What is the situation in Wageningen?

Text Marieke Enter ◆ Illustration Valerie Geelen

'We claim the night. Let women get home safely.' These heartfelt words by the author Nienke 's Gravemade sparked a crowdfunding campaign that raised over 250,000 euros in 48 hours. According to the initiator Danique de Jong, over 90 per cent of the donations came from private individuals. 'That shows how much people want things to change,' she says. It also says something about how many women sometimes feel afraid when out and about – too many.

'In general, female students feel safe in Wageningen,' says Mel van de Par, the chair of the feminist student society Thalia. 'Some international students even find the safety situation a huge relief compared to their home country.' Despite this, Thalia's members regularly have worrying experiences in and around Wageningen. 'Recently, one of our members was out near Dijkgraaf late at night when she was approached by an angler who said he had caught a huge fish and needed help hauling it in. He asked her to come with him – pointing to a dark, secluded spot. She couldn't get away fast enough.'

Public transport

Thalia's members also have plenty of stories of nasty incidents in public transport – such as men who sit too close to you in the train, start a weird conversation with you or stare at you while touching themselves. Van de Par says she always makes sure she sits somewhere with other passengers nearby; she would never sit in a carriage on her own. The train staff even warn you about that, as a Thalia member sitting on her own discovered recently. 'That's actually quite worrying,' says Van de Par.

In addition to virtually empty train carriages, bus shelters are another notorious location. The Thalia chair avoids them if possible, especially after dark. 'Bus stops are often in out-of-the-way, badly lit places. If a group of men drive past slowly in a van or car, shouting all kinds of sexual remarks at you, there is nowhere for you to go. That is really scary.'

Young lads

In addition to the vans, fat bikes are regularly mentioned in stories about menacing situations. Particularly notorious are the groups of local Wageningen lads who go around on these bikes. 'They are often really young, aged about 13 to 15, but they can be very annoying and intimidating,' says Alita Tithphit, chair of South East Asian Student Association Wageningen (SEASAW). And they seem to target Asian women. A few years ago, *Resource* was getting reports from Chinese female PhD candidates of harassment by these teenagers. They would block their path and taunt them with denigrating, sexual quotes from films such as *Full Metal Jacket* or *Good Morning Vietnam*. Women who look Asian have also been shot at with large water pistols.

It might not be hugely dangerous, but it is definitely intimidating and threatening. 'These young lads clearly think they can get away with anything. That's why there's this fear that their intimidating behaviour could turn more physical,' says the SEASAW chair. Her

Women assaulted in bus

Last Sunday evening, three women reported a sexual assault on a bus in Wageningen to the police. The bus driver realized the women were being harassed and made the man get off the bus. The police were able to arrest the man a little later at the bus station. The police could not say whether the women were students 'for privacy reasons' — but did say they were all 'in their early 20s'.

‘THAT MENACING FEELING IS ALWAYS THERE, AND IT GETS UNDER YOUR SKIN’

equivalent at Thalia would like the police to be more visible and take action more often. ‘That would make me feel a lot safer – more than when they check our bike lights for the umpteenth time.’

Rainbow

While the calls within society to reclaim the night are mainly about the safety of cis women, many people in the rainbow community also feel unsafe when they go out at night. Nutrition & Health Master’s student Luca Laane, who identifies as non-binary, knows all about it. When they didn’t respond to flirtatious comments from a group of lads passing by, the tone immediately became aggressive. ‘That’s not a nice lady. Hang on, *is* she even a lady? No, right?’ Recently, Laane and a female friend (‘not even my girlfriend’) were coming home from a party and a drunken man in the street called them all kinds of names: ‘Look at those pussy munchers.’

Laane’s strategy is to ignore the abuse to prevent the situation from escalating further. ‘But I’m constantly on my guard.’ It’s a familiar feeling too for Rob Manders, a volunteer at the LGBTQIA+ society Shout! ‘Even if nothing really bad happens in Wageningen on the whole, you’re always on the alert. Especially after an unpleasant incident such as recently when the drag artists were threatened during the WagaStorm event on 5 May. I mean, those drag artists are pretty tough, it takes a lot to scare them, but even they thought it was scary. That menacing feeling is always there and it gets under your skin.’

No realization

The people *Resource* spoke to for this article are not particularly hopeful that the reclaim-the-night campaign will make our streets safer. Of course they hope everyone will be able to go out at night, regardless of their gender or sexual orientation, without having to think about what they are wearing, what route to take and who can accompany them home safely. But they don’t see that happening given the current political climate. ‘Local authorities too don’t really realize the extent to which everything here is designed by and for men, with no attention being paid to the female and queer perspective on safety in public spaces,’ concludes Thalia’s Van de Par. ■

The secrets of parchments

In the Middle Ages, scribes and illustrators worked on parchment. Modern genetic and protein analyses reveal the biological secrets of these animal skins. Text Roelof Kleis

Plant sciences researcher Elio Schijlen had never heard of biocodicology until a couple of years ago. Now, he can justifiably call himself a budding biocodiologist – someone who uses biological techniques to study the material properties of old manuscripts (codices, the plural of codex). It was his expertise in molecular biology and genetics that took Schijlen on this new path exploring medieval art.

It all started with a question from the Maelwael Van Lymborch Studies foundation in Nijmegen. This is the centre for academic scholarship on the Van Lymborch family of artists. The brothers Herman, Johan and Paul van Lymborch are sometimes called the Rembrandts of the Middle Ages. The foundation asked Schijlen whether he could examine various parchments that are part of a medieval codex linked to the three brothers (see inset on *Master B*).

Schijlen is the head of the Plant Sciences DNA sequencing facility, which deciphers genetic codes. ‘The foundation wanted to know whether we could use that technology for the analysis of medieval parchments, for example to find out what animal was used to make the parchment,’ explains Schijlen. The request resulted in a project funded by the Dutch Research Council and the Nijmegen foundation, with Naturalis and Radboud University involved as well. ‘Until recently, studies of old manuscripts mainly looked at the author’s handwriting,’ continues Schijlen, ‘and physical properties of the parchment such as the texture, the ink and the paint. Genetic analysis can provide new, additional information, such as the animal used to make the parchment, its sex and possibly data on the breed or geographical origins. This can then be used to determine the relationship between different sheets of parchment. What is more, moulds and bacteria tell us about the state of the parchment. Such investigations were impossible until recently as the technology was not sufficiently advanced. Anyway, the extraction of protein and DNA would have been destructive, which is of course unthinkable with such historically and culturally valuable objects.’

Rub off

The technology and science have advanced so rapidly that these biological analyses are now possible. Schijlen and his colleagues were given the opportunity to take samples from nine sheets of

Master B

The three parchment sheets Schijlen studied came from a book of hours, a collection of Christian prayers and other texts. The pages of this book have become separated over time, but the book was probably part of the collection of the medieval bibliophile John, Duke of Berry. The illustrations of vine tendrils in the margins match those of the famous book of hours *Belles Heures*. That book was illustrated by the Van Lymborch brothers, who were commissioned by the duke. To be clear, the brothers were responsible for the wonderful illustrations elsewhere in the book, but they didn’t draw the tendrils; they were done by an unknown illustrator called Master B. where the ‘B’ stands for *Belles Heures*. Some of the books in the Duke’s collection have been lost. The sheets Schijlen investigated almost certainly come from one of the books that had been thought lost, of which 81 sheets have now been found.

One of the sheets of parchment from a medieval codex that Elio Schijlen examined. Margin decoration by 'Master B.' ◆ Photo Maelwael Van Lymborch House

parchment, taken from medieval books in different collections: the three sheets that the project was about and as a reference several sheets from the Kasteel Huis Bergh collection and from a private collection. The analysis focused on traces of DNA and the protein collagen. Either can be used to reveal which animal provided the parchment.

Parchment is made from the hides of farm animals. That hide is largely made up of the protein collagen, the composition of which varies with the species. Schijlen obtained the protein by literally rubbing it off from the surface. This method is non-destructive

Page from the *Belles Heures* book of hours. Miniature painted by the Van Lymborch brothers. Margin decoration by 'Master B.' ◆ Photo Maelwael Van Lymborch House

and does not harm the parchment. The same cannot be said for the extraction of the DNA. 'We needed to cut off a tiny piece of parchment for that. This would usually be impossible for an old codex because you are damaging the book.'
The protein analysis involved determining sequences of amino acids, the protein building blocks. The composition of amino acids is a characteristic of the species. In the analysis of the DNA, thousands of sequences of short fragments were compared against reference genomes for cows, sheep and goats. Schijlen: 'Many fragments are identical for the three species, but you still see that a sample can have far more matches for one of them.'

Cowhide

The genetic analysis revealed large differences between the parchments. Those are differences in the genetic history, says Schijlen: 'In principle, you might come across DNA from any living thing that has been in or on the parchment over the course of the centuries. That includes insects, pollen and microorganisms that landed on the parchment, and the people who held it. Those genetic traces are basically a kind of fingerprint of what has happened to the sheet over time. One of our conclusions is based on that and shows that some parchments are more closely linked because they share the same microbiome to some extent. That is very valuable information.'
The study showed that eight of the parchment sheets were made from cowhide and one from the hide of a sheep. The animals are related to different breeds. The three sheets that the project was about were made from the hide of a bull in northern France in the period 1410-1420. The date was not determined by Schijlen's analysis; it was already known from previous research on the handwriting and the illustrations. According to Schijlen, it is not yet possible to date the parchment using genetic analysis. 'To do that, you would need reference genomes for animals living at that time, and we don't have much information on those old breeds.'
Schijlen assumed that would be the end of this interesting diversion, but there might be a follow-up. The publication of the study has led to a request for a new and possibly even more exciting investigation, looking at 'the last Da Vinci'. Schijlen: 'It also involves a sheet of parchment, with an illustration attributed to Da Vinci that is thought could be a missing page from the book *La Sforziada*. We might be able to test that using DNA analysis.' There is only one problem: money. 'We are still looking for funding. But once we've got that, we should be able to start before the year is out.' ■

Van Lymborch year

Fans of the work of the Van Lymborch brothers have plenty to celebrate in 2025. There is an exhibition (from 7 June to 5 October) of the famous book of hours *Très Riches Heures* in Musée Condé in Chantilly, north of Paris. This book is almost never put on display, but it has been partly unbound for restoration purposes. The *Belles Heures* (from New York) and *Bible Moralisée* (from Paris) are also in the exhibition. The Maelwael Van Lymborch museum in Nijmegen has organized various events to tie in with this exhibition. If you can't make it to Nijmegen, you can admire the famous illustrations anyway on the museum's website.

Bianca

La Sforziada is an ode to the Italian Sforza family. The book, which has a missing page, has been in Poland since the start of the sixteenth century. A sheet that could be the missing page, with a portrait of a young woman, turned up in a Christie's auction in New York in 1998. The buyer purchased it for 21,550 dollars. Later examination suggested it could be the work of Leonardo da Vinci. The young woman in the portrait is Bianca Sforza, who would have been about 13 or 14 and would have just got married to Da Vinci's patron. The portrait is thought to have been a wedding present. Bianca died a few months later. The portrait's origins are the subject of debate and an investigation of the parchment could shed more light on the matter.

Viewpoint

‘Climate opinion of highest UN court puts pressure but is not magic wand’

The island state of Vanuatu — which is suffering badly from rising sea levels caused by climate change — wanted the highest UN court to give its opinion on states’ obligations regarding climate change and on what should happen if states fail to fulfil those obligations. The International Court of Justice issued its advisory opinion at the end of July. *Resource* asked Law Group assistant professor Chiara Macchi what it all means.

Text Dominique Vrouwenvelder

What does the advisory opinion say?

‘In the Paris Climate Agreement in 2015, 195 countries agreed to seek to stop climate change and keep global warming below 1.5 degrees with respect to temperatures in the pre-industrial era. They were allowed to decide on their own national measures. It now turns out not all countries have made enough of an effort, which is why we are increasingly seeing the effects of climate change. ‘According to the International Court of Justice, nationally determined measures must be aligned with the goal of 1.5 degrees. Those contributions must also be of the “highest possible ambition” while being based on the best available science as laid out by the IPCC (the UN’s Intergovernmental Panel on Climate Change), and must become increasingly demanding over time. This advisory opinion is not a binding judgment, but it’s still extremely authoritative and could affect how national and international courts interpret laws. This opinion by the International Court of Justice also puts an end to the narrative of certain states that they have full discretion in how to address climate change.’

So now countries that have weak or non-existent climate policies can be held to account?

‘Yes. The International Court of Justice says combatting climate change is an *erga omnes* obligation, meaning an obligation states owe to the international community as a whole. That also implies any failure to fulfil such obligations concerns all countries, not just the countries that are harmed by climate change. Any state can hold another state to account for failing to comply with those obligations, even if the complainant state hasn’t been harmed directly by climate change. In practice, whether this happens will depend on states’ political willingness to hold other states accountable, potentially fuelling diplomatic tensions.’

‘Any state can hold another state to account, even if the complainant state hasn’t been harmed directly by climate change’

So what will happen?

The UN court says countries have to cooperate more with one another because climate change is a shared problem. In particular, developed countries must provide financial support and technology transfer to developing countries. In addition, the International Court of Justice says that the duty of states to cooperate in combatting climate change is a rule of customary international law, which means that it is an obligation for all states regardless of whether they have signed the relevant international treaties – such as the Paris Agreement.’

Can this decision be used to put pressure on states?

‘Civil society organizations (such as Greenpeace and Milieudefensie) could start lawsuits against states from a stronger standpoint. They can rely on this legal opinion, as an authoritative interpretive source, when asking the courts to compel states to adopt more ambitious climate policies. Unfortunately, the advisory opinion is not a magic wand that can force governments to do their job, but it is an additional tool in the fight against climate change. That is the best hope we have.’ ■

SIZING UP

It is almost as iconic an image of the new academic year as the gowns at the official opening in Omnia. We are talking about the queue of students collecting their lab coats (about 1,300) and glasses (some 1,250) in Forum. Service Desk staff help them try everything on because the details matter for safety. When you stretch your arms out, do the sleeves cover your skin? Can you wear a jumper underneath without the buttons coming undone when you sit? Do the glasses stay on when you bend forward? All set for a new year in the lab. ME

Photo Marieke Enter

The bigger the better has downsides

Tractors torment the soil

Agricultural vehicles are far too large, says soil researcher Guido Bakema. They compact the soil, which inevitably has negative consequences.

Text Roelof Kleis

It has to be admitted they look very impressive, those giant tractors deploying equally massive machines to harvest the crops quickly and efficiently. And agricultural machinery seems to be getting bigger and bigger. But is that actually good for the soil?

The answer is a resounding 'no', says researcher Guido Bakema. He is an expert on soil compaction. Farmland is suffering from the increasing pressure put on the soil from the ever heavier machines. 'The weight increases by 20 per cent every 15 years,' says Bakema, who is worried about the consequences of this trend for the soil. He argues that 'soil compaction is a secret killer'.

The reason for the trend is obvious: efficiency. 'Bigger machinery makes it possible to work faster, with fewer labourers.' But a fascination with size also plays a role. 'As with cars, people love the huge machines. I have a neighbour who thinks it's amazing to drive his tractor, perched high above the road, racing along at 50 kilometres an hour.' But there is a downside to that fascination. The soil is gradually becoming compacted, which has an effect on how it functions. Yields fall because it becomes harder for water and air to penetrate the soil. In dry periods, plants can't reach the water further beneath the surface. During heavy downpours, fertilizer and chemicals are more likely to be washed off into the ditches.

So far, many farmers can keep the problems at bay by using irrigation and fertilizers. 'The negative effect on yields also depends a lot on the soil type and the weather. Plants are affected more in dry years than in wet years, because in wet years the plants don't need to reach the water that is deeper under the ground.'

But not all farmers have the option of irrigation, says Bakema. 'In many areas, you are likely to face bans on the use of surface water. So you would need to use groundwater, but that isn't always available, or it's brackish.'

Ploughing and turning

If soil gets compacted, ploughing or turning it over can loosen it. But that only affects the top layer, whereas the problem is mainly in the deeper layer 25 to 50 centimetres below ground level. 'The deeper a particular plant's roots go, the more it is affected by compaction; for instance in the case of maize with roots going down 80 to 90 centimetres. However, the problem also affects plants that don't normally have deep roots but need to access deeper water when there is a drought: they can't get to the water because of the compact soil.'

'Farmers don't have complete control over their land anymore'

Plants adapt if at all possible, according to research (the project 'Delving into Soil Compaction') that Bakema and colleagues carried out for the Ministry of Agriculture. If a maize plant senses compaction, it produces thicker roots. Bakema: 'The roots are twice as thick and therefore strong enough to penetrate the compacted layer. Once the roots have passed through that layer, they become thin again. What is more, research by colleagues at Utrecht shows the roots of some plants secrete a kind of lubricant that makes it easier to penetrate a compacted layer.' Problem solved? Unfortunately not. 'The thicker roots cost the plant energy,' continues Bakema. 'That is energy it can't invest in growth above ground, which is a big disadvantage.'

Even so, the study shows that plants with deep roots can be one solution. 'The soil

has a porous structure,' explains Bakema. 'When you put weight on the soil, the pores are compressed. Our research shows larger pores compress more easily than smaller pores. That means the porous structure survives to some extent. Plants with deep roots can penetrate those smaller openings. They don't churn up the soil completely, but that isn't necessary because they do prepare the soil for the next crop. If you use a combination of plants with deep roots and a variety of root systems, you will create a diverse soil structure.'

That finding has consequences for the definition of compacted soil. A simple indicator was used for a long time: the dry weight of a cubic metre of soil. If that exceeds 1,600 kilograms, the soil is compacted. 'This norm was set – for sandy soil – by a German professor in the 1970s, and it has been used as the yardstick ever since. But our research shows soil compaction is a sliding scale because soil can be compacted at values below that norm. Or a particular soil can be naturally above that norm. It depends on the type of deposits that created the soil. Anyway, you never know what a soil was like originally. There isn't a single square metre in the Netherlands that hasn't been stamped on by humans. We therefore advocate putting less emphasis on the bulk density and more on the distribution of the soil's porosity. That is far more important.'

Setting limits

Even so, prevention is better than cure. In a policy advisory report for the ministry, Bakema therefore recommends setting limits for the weight (10 tons per axle) and tyre pressure (1 bar) of agricultural machinery. The greater the tyre pressure, the greater the weight the tyres can take. 'There is a similar weight limit for trucks on the roads because otherwise they would damage the bridges and asphalt. So why not have a limit for agricultural machinery on farmland? If you don't set a limit, the trend of ever larger machines will simply continue. Of course, it also depends on what weights you are carrying onto the land. If you are spreading manure, you could take half a tank instead.'

According to Bakema, a lot of farmers know deep down that the heavy machinery isn't good for the soil. 'But they are trapped in the agricultural system. Farmers don't have complete control over their land anymore. They need to be competitive and deliver their products on time, and they often depend on agricultural contractors for this. They in turn inevitably use large machines to get the job done efficiently. What is more, a lot of land is leased, so the farmer is only farming it temporarily. That complicates the efforts to prevent soil compaction.' ■

'Soil compaction is a secret killer'

Agricultural machinery is becoming heavier and heavier, which is causing soil compaction and affecting how the soil functions: it is harder for water and air to get into the soil. ◆ Photo Shutterstock

Synthetic biology: shedding new light on fundamental questions

‘LIFE IS UNBELIEVABLY COMPLEX’

In her PhD research, the philosopher Julia Rijssenbeek sought out the labs conducting synthetic biology in its most extreme forms. At the start of the summer, she received her PhD (with distinction!) for her analysis of the philosophical and ethical aspects of this branch of science, which is constantly tinkering with the limits of what can be defined as life.

Text Marieke Enter

For non-experts, Rijssenbeek’s research topic sounds like sci-fi, as it involves phenomena such as biobots (minuscule robots made from living cells) and SHEEFs (synthetic human entities with embryo-like features – clusters of stem cells that look a lot like a human embryo at two to three weeks). But such things are routine for scientists in this field and researchers are now working on the next breakthrough, building living cells from non-living materials – although they are not there yet. ‘We are capable of developing artificial intelligence but we still don’t really understand how a cell works, despite that being the basis of most life forms,’ says Rijssenbeek. ‘Life is unbelievably complex.’

For her research, she visited the famous WYSS institute and the Church Lab at Harvard, named after the geneticist George Church, who is known for his pioneering work with DNA sequencing, paving the way for a comprehensive picture of the human genome. Rijssenbeek describes him as ‘a truly brilliant man, but also someone with quite bizarre ideas’ – such as his notorious plan to resurrect the mammoth. The reason why Rijssenbeek wanted to look specifically at these labs is because they are where the most advanced things are happening. ‘The rules are quite strict in Europe. In America, they go somewhat further – or are more reckless, you could say.’

In most cases, research in synthetic biology has a clear, practical objective. For example, the scientists want to use modified bacteria to produce substances that are useful to people, such as biofuels, insulin or proteins. ‘As a result, the field is full of language that reduces life forms to input/output machines,’ she says. ‘But synthetic biologists are also invariably concerned with fundamental questions about life, either directly or indirectly. Insights from that research can serve as inspiration for philosophy too.’

What is life?

What is life? It is one of the oldest philosophical questions. Indeed, Rijssenbeek’s supervisors advised her at first not to delve too deeply into that topic, but she couldn’t really avoid it. ‘If I’m supposed to be reflecting on scientists who build life, my first question has to be: so what is life? And how does that change

‘SYNTHETIC BIOLOGY USES HIGHLY TECHNICAL LANGUAGE, BUT WORDS COLOUR YOUR VIEW AND PERCEPTION’

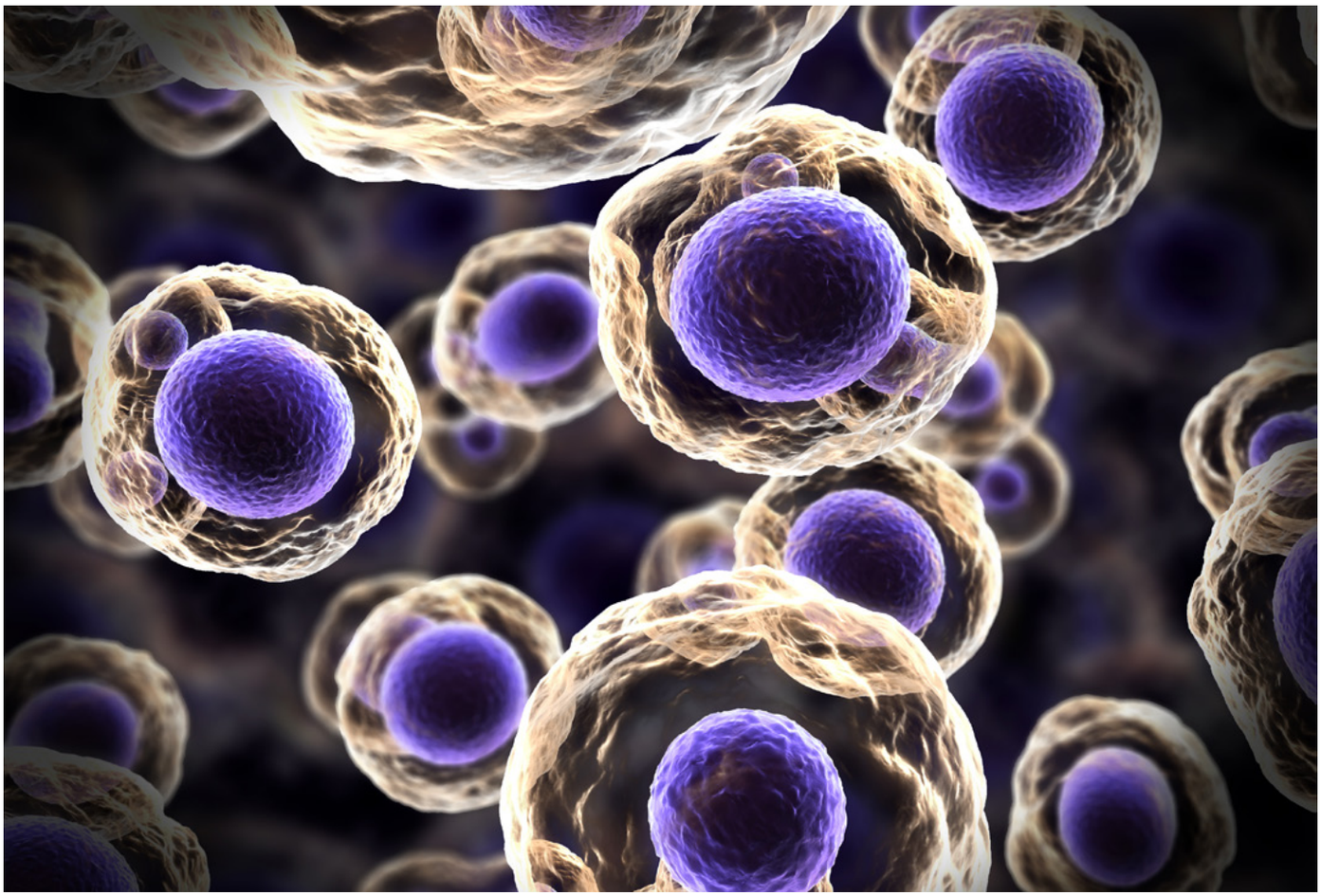


Photo Shutterstock

when humans try to build it?'
The blurred or shifting dividing line between the living and the non-living in synthetic biology gives rise to all kinds of new questions. These are ethical questions such as how we should deal with these synthetic life forms, as well as questions about fundamental concepts such as 'life', 'organism' or 'machine'. What do we actually mean by such terms? Rijssenbeek: 'Synthetic biology uses highly technical language: it talks about units, platforms and reactors. What's in a name, you might think, but the words you use colour your perception, what you see. For example, I'm highly critical of the term "cell factory", which is a completely accepted concept in synthetic biology. But you are in fact reducing a living thing to a kind of object that only has an instrumental value because it produces something that is useful to humans. The terminology says a lot about our self-image; it reflects the spirit of the age of the Anthropocene, with mankind as the ruler of the world.' Rijssenbeek says the language used should always be critically examined: what are people actually saying? If you replicate a cell in the lab that only has some of the functions of a real cell, can you call it a cell? She raised this question with the American researchers too. 'I couldn't get a discussion going using the standard ethics questions. But when I asked them to tell me how they see life, how they would define it, they were

Wageningen examples

There is synthetic biology in Wageningen too. *Resource* has previously reported on a self-test for intestinal cancer that students developed. All you have to do is check whether your poo has a certain colour. It uses probiotic bacteria that have been genetically modified to react to biomarkers for intestinal cancer and produce a chromoprotein that changes the colour of the faeces. Then there was the PhD candidate Lyon Bruinsmaet, who was able to modify the bacterial strain *Pseudomonas putida* in such a way that he could use it produce anisole, an ether that could previously only be made via a chemical pathway. Many more projects are listed on the site of the Systems & Synthetic Biology chair group.

keen to talk about that – in part because there isn't always time and room for such discussions when they're working so hard on the science in the labs. At one point, I'd got a group of scientists together who were working on a project on biostasis, in which they look for the point between when something is just being kept alive and when it reaches irreversible death. I put the following questions to them: when is something alive, when is it dead, and do you all have the same views on this? It turned out this was the first time they had talked about this, even though it was the subject of their research.'

Machine

The type of person also plays a role here, thinks Rijssenbeek, in addition to the high workload and pressure to perform. 'Biotech specialists are real engineers. They simply want to build solutions, and building those solutions is how they try to get a better understanding of what life is. But this field of research increasingly shows we can't take a reductionist approach to life. Life is not a machine that you can disassemble into its component parts and put together again to see how it works. It's not that simple. I actually found it quite cool how, in every single project I looked at, the research only led to more questions.'

In her PhD thesis, Rijssenbeek emphasizes the importance in this field of applying collaborative ethics – in which life scientists and ethicists work together – from an early stage in the research.

'Philosophy and ethics are often seen as a retrospective reflection once the findings have progressed beyond the lab. But I discovered that is too late in the case of synthetic biology. By that point, you can no longer pose fundamental questions such as: what are we actually doing? And this field, where you are playing with life and death, is precisely one where researchers need to be able to reflect deeply on what they are doing. Equally, it is good for philosophy to be involved in a field where so much is happening. It's all very well sitting in a comfy chair in your office philosophizing on what life is, but you get a completely different perspective from being in a lab and seeing what is going, what effect that has on scientists and how they talk about it. You learn from that, because synthetic biology sheds new light on fundamental questions.'

Incidentally, the Wageningen philosopher is not pessimistic about that new light. 'The fact that the research projects keep throwing up new questions means life is constantly doing something other than what we humans wanted it to do. So it's all very well thinking we can replicate life in the lab, as if we're playing at being God, but we're still a long way off that. Perhaps it sounds strange, but that makes me optimistic. It shows that life is still so enthralling, with so many treasures yet to be discovered.' ■

'LIFE IS NOT A MACHINE THAT YOU CAN DISASSEMBLE INTO ITS COMPONENT PARTS'

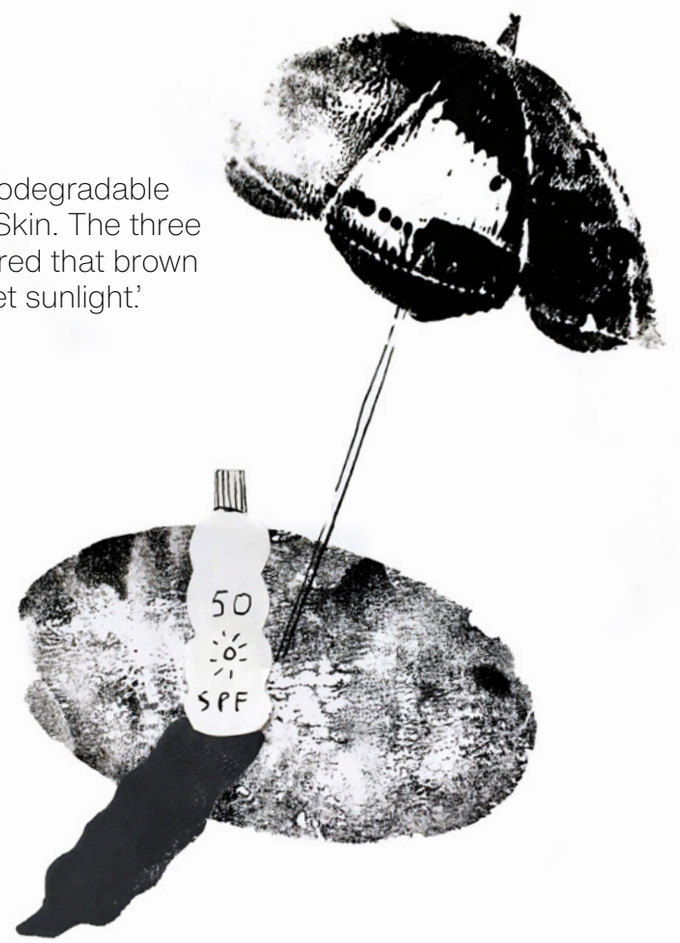
Video

Rijssenbeek made a short video as part of her research project as a way of investigating human-nature relationships, an alternative to the philosophical jargon in publications that will only be read by a select group of academics. For the video, she worked with a dancer and a robotics scientist. 'As humans, we are constantly interacting with other life forms on this planet. You can see this as a kind of dance, a universal language in which humans are not necessarily in control. Making the video was an amazing experience and I learned so much.'

Students come up with seaweed-based sunscreen

Three Indonesian WUR students are developing a biodegradable sun cream based on seaweed, which they call Sea2Skin. The three are competing in a European challenge. ‘We discovered that brown seaweed contains a pigment that can block ultraviolet sunlight.’

Text Dominique Vrouwenvelder • Illustration Marly Hendricks



Daniel Panigori Simanjuntak, a Master’s student in Biobased Sciences, came to Wageningen last year to learn more about the utilization of bio-resources. During one of his courses, he met fellow students Wildan Hakim (Biobased Sciences) and Dina Yurika (Biosystems Engineering). Together, they formed a team for the Bio-based Innovation Student Challenge Europe (BISC-E). They won the Dutch national competition for this challenge last spring and now they are preparing their business case for seaweed-based sunscreen for the European BISC-E finals. At the same time, they are conducting market validation research to test the commercial potential of their concept.

Pigment

‘We signed up for the student challenge, but at first we didn’t know what to do – bio-based innovation is such a broad topic,’ Panigori Simanjuntak admits. ‘Because I was interested in seaweed and the others were interested generally in bio-resources, we started exploring the options for seaweed.’

‘We found out that brown seaweed contains a pigment called fucoxanthin. We know pigments can block ultraviolet light from the sun. That makes seaweed an interesting ingredient for sunscreen. It also has anti-cancer and antioxidant properties, which is very promising for skincare. This could be a sunscreen product that protects both people and the planet.’ At this stage, the team is testing the sun cream’s properties as a cosmetic formulation, such as how easy it is to apply to the skin and whether it remains homogenous over time.

Traditional sunscreens rely on either chemical or mineral UV filters. The chemical version is petroleum-based, and some compounds — like oxybenzone — can harm coral reefs due to coral bleaching. The mineral version uses white particles, usually zinc oxide or titanium oxide, which leave a visible white film on the skin. ‘That is not a problem for people with a light skin colour, but it’s less ideal for others,’ says Panigori Simanjuntak. ‘Seaweed pigments, however, are brownish.’

Semi-final

For the BISC-E challenge, the team explored three categories: the technical feasibility, the business case and the environmental impact. ‘After the national final, we took a break from the project during the summer holidays,’ says Panigori Simanjuntak. ‘Now we’re preparing for the European competition, where we will face the national winners of other countries.’ The semi-finals are in September. If the students get through that round, they will present Sea2Skin at the final in Brussels in October. Meanwhile, the students are contacting skincare companies in Indonesia and Europe to explore the market for bio-based compounds. ‘We don’t want to end up developing a product no one is interested in,’ says Panigori Simanjuntak. ■

We are shrinking. A disaster or not?

Far fewer students are enrolling at Wageningen. The exact decline is not yet known, but applications were down by more than 9 per cent on last year and there were 16 per cent fewer AID freshers. In other words, there has clearly been a substantial drop. How bad is that? Text Luuk Zegers ◆ Illustration Shutterstock

'It could even signal the end of some smaller societies'

Daan Smit
President of WSV Ceres

'The decline is bad news for student life. If fewer students come to Wageningen, there will be a smaller pool for the student societies to fish from. Membership numbers will fall and it will be even harder to find people for board and committee work and to keep the societies running properly. We haven't got to that stage yet but if this trend continues for several years, we'll have to start thinking about where to make cuts. It could even signal the end of some smaller societies, which would be a real shame. The societies are a large part of Wageningen student life. Being a member of a society can enrich your university experience and personal development. That is why we need to work with other societies, the municipality and the university to see what can be done.'

Dick de Ridder
Dean of Education

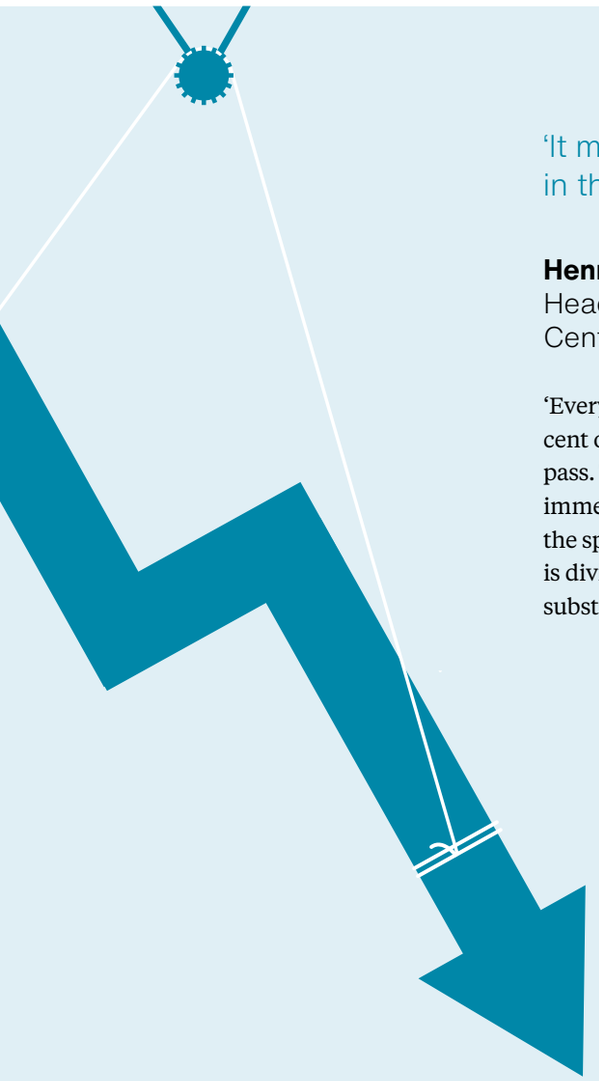
'Of course, WUR has grown immensely in the past 10 to 15 years, so a bit of shrinkage isn't a problem. But it is happening rather faster than we expected.
'We educate people to be capable of introducing the changes this world needs, and more such people are required than ever. We also excel at education, which is at the heart of what we do. It's no coincidence we have been the top university 20 years in a row according to the *University Guide*. It's a shame this is becoming less of a factor for prospective students. And fewer students means less government funding. Coming on top of the cutbacks we already had to make, this could be a real challenge for the chair groups.
'How can we turn the tide? We have critically reviewed our degree programmes in a portfolio analysis, we're working on a more coherent story about Wageningen for prospective students and we are investing more energy in student recruitment. Perhaps we waited too long for this, but now we have set everything in motion.'

'We are investing more energy in student recruitment, but perhaps we waited too long for this'

'We now have to fund a larger proportion of the joint courses'

Marjolijn Coppens
Biology programme director

'Any degree programme would prefer a stable intake. Rapid growth is not good as that leads to a big increase in the workload. But you don't want a big decrease either because that's financially challenging and you don't want to have to make people redundant.
'Fortunately, the numbers for Biology have stayed stable, but we are still affected financially because other programmes have seen a fall so we now have to fund a larger proportion of the joint courses. Why has the intake for Biology stayed the same while other degrees have shrunk? I can't really put my finger on it. We're all doing our best and all the programmes are good.'



Bart van As
Director of Idealis

‘Wageningen is one of the top universities internationally and is consistently voted the best university in the Netherlands by students. It’s hardly surprising to see the intake falling, as that could be predicted from demographic trends. The wider developments are more concerning. The current political environment means less attention is being paid to urgent issues that WUR is an expert on, such as climate change, food security and biodiversity. In addition, international students feel less welcome and other universities are copying our degree programmes, while the total number of students is declining. That is putting pressure on WUR’s unique position.’

‘Despite all this, I have confidence in the university’s resilience. Here at Idealis, we are enhancing Wageningen’s appeal as a university town by charging the lowest room rents in the Netherlands and by making sure every student is offered a room in their first year at university. That is unique in the Netherlands, especially in these times of accommodation shortages.’

‘It’s hardly surprising the intake is falling as that could be predicted from demographic trends’

‘It might be quieter in the gym’

Henri ten Klooster
Head of De Bongerd Sports Centre

‘Every year, between 54 and 57 per cent of new students purchase a sports pass. The falling intake probably won’t immediately have a major effect on the sports clubs because that decrease is divided over 31 clubs. But if we see substantial falls several years in a row, that could endanger the existence of some sports clubs. We have now set an explicit lower limit for student sports club memberships in collaboration with the student sports association Thymos. A club has to have at least 15 members to qualify for support.
‘On the positive side, about 60 to 65 per cent of the students with a sports pass use the gym. So it might be a bit quieter now thanks to the falling intake.’

‘Someone from Utrecht is not the same as someone from Wageningen’

Ingrid Hijman
Head of the Student Service Centre

‘The world will always need more Wageningen people, given how many problems it is facing. Other universities are tackling our themes but at the end of the day, someone from Utrecht is not the same as someone from Wageningen. To put it bluntly, in Utrecht they study a phenomenon and write a report, but in Wageningen they will have spoken to various stakeholders too and they will include at least one paragraph about the applicability. Other universities design complex policy plans for well-being. We don’t design policy plans, we get down to work. That can-do mentality is typical Wageningen. We are smart, practical, intrinsically inquisitive problem solvers.
‘What needs to change? Perhaps we should make our admission requirements less strict. For example, at present you need to have passed physics, maths and biology to study Soil, Water & Atmosphere, but how motivated you are is more important than whether you did the right subjects at school. We are excluding a lot of people unnecessarily because of some choice they made as a teenager.’

Let us know what you think at

resource-online.nl

TURNING TOWARDS THE FUTURE

A radical change of approach is needed to save the world, claims ecologist and Spinoza prize winner Marten Scheffer in his new book *De Kanteling* ('The Turning Point'). He too has reached a turning point as he will be retiring. Text Roelof Kleis ◆ Photos Duncan de Fey

His retirement is purely an administrative change, though. His formal appointment will end, but he will carry on working. 'I get so much pleasure from my work as a scientist and musician,' explains Scheffer in his 'garden office' at his wonderful home in the Betuwe region. 'It's a way of life and that doesn't stop when you turn 67. I am also lucky in that I still have nearly half [one million euros] of my Spinoza prize money left.' He can simply continue doing what he always did: bringing people together for new collaborations.

It is hardly surprising Scheffer chose 'The Turning Point' as the title of his new book. The theory of tipping points (see inset) has been a constant element in his scientific career. His interest in – or perhaps more accurately passion for – complex dynamic systems started when he was a Biology student in Utrecht, where he was taught by Paulien Hogeweg, a bioinformatics pioneer. 'What was so amazing about her lectures is that almost nobody understood them and yet we were still enthralled. We realized something deep was going on. It was all about tipping points, chaos theory and how the patterns on a giraffe's hide come about, how phenomena can arise through simple local interactions. Various students of my generation who were taught by her continued in that field and became professors. That is a wise lesson: meaningful education generates a fascination.'

Generic principle

Scheffer's fascination took shape during his first job, working for the Directorate-General for Public Works, where he was tasked with figuring out how to make cloudy lakes clear again. Whatever they tried, nothing worked. Until Scheffer heard about the idea proposed by the British aquatic ecologist Brian Moss that the cloudy lake was trapped in that state and there was also an alternative, clear state. 'Hey, I thought, that sounds familiar. And I knew the maths behind it.' The water could only be flipped back to the clear state by rigorously removing the fish. 'Later, it turned out that an abrupt switch between two essentially stable states in equilibrium is a generic principle that is applicable in a wide range of complex dynamic systems, including rainforests, coral, financial markets and migraine. It was a huge success.'

In his book *De Kanteling,* Scheffer applies the theory to the biggest dynamic system we know about: the world today. According to Scheffer, our world is fast approaching a decisive tipping point. The signs are unmistakeable. Social tensions, unrest and instability are increasing around the world and climate change is threatening to destroy the planet. But this destiny is not inevitable, he argues. The world could also tip towards a good Anthropocene. In fact, we have all the ingredients for that outcome.

TIPPING POINT

Gradual changes can harm the resilience of a stable system to such an extent that it becomes vulnerable. A slight disturbance can then be all that is needed to make it flip to a completely new state. That process can be charted using relatively simple maths. The tipping point is inherently unpredictable, but signs that a system is getting close to such a critical point are quantifiable: the system takes longer and longer to regain its equilibrium after a disturbance.

The book reads like a magnum opus, a synthesis of your work as a scientist. Was that the intention?

'No, but that's how I see it too in retrospect. My publisher initially asked me to write a new version of my previous book *Critical Transitions in Nature and Science*. But I haven't actually been doing much on ecology and the climate since I wrote that book ten years ago. My work has been focused more on people and the question of why we continue to behave one way when it's so evident that we need to change. Why is nothing happening, and can we do anything about it? That's the underlying question in this book.'

But the book goes much further, as you are calling for a radical transformation. That is quite activist.

'As a scientist, you are used to explaining how things work. I want to go beyond that and make a meaningful contribution. In my opinion, a radical transformation is the only way to force the changes go fast enough.

'IT'S A MISCONCEPTION TO THINK PEOPLE ARE EGOTISTICAL OR BAD'

We've been talking about how things need to change for so long. There are lots of good intentions and many good things are being done too, but the concentration of CO_2 in the atmosphere is still rising and nature is still in decline. Climate change is speeding up the rate of deterioration as well. The situation is urgent, and things need to change fast.'

The world once it has passed the tipping point is unknowable by definition – we could have a broken society or a glowing future. Death or a bed of roses. Isn't a tilt like this dangerous?

'I'm not the one starting the tilt. Social unrest is here already. The tensions are here already. The biggest changes, such as the revolutions in China, Russia and France or the rise of the Nazis in Germany, always happen when a society destabilizes. Those are the occasions when significant opportunities arise. What happens after such a period of instability depends on the available narratives, what is in the air and what resonates with people. At present we've got the narratives of Trump and Wilders and the competing story of zero growth. I'm a storyteller. People listen to stories, not facts. I try to tell the story of another alternative and what steps are needed for that. I'm telling a positive story, because people need that. This is an issue for our students too: will things work out in the end and what can they do?'

The main obstacle to change is what you call the 'chokehold of an invisible hand'. What do you mean by that?

'The invisible hand is a metaphor used by the Scottish political economist Adam Smith. According to Smith, the free market and price mechanism function without any top-down intervention. Supply and demand are matched thanks to the self-interest of consumers (who want to pay as little as possible for a product) and of producers (who want to sell as much as possible and so keep the product price low). But things can easily go wrong, which stops the market functioning properly. Examples are cartels, lobbying, mass advertising and established parties influencing politicians and public policy. The invisible hand then turns into a chokehold, preventing change.'

Isn't that inevitable because human nature is so bad?

'No, on the contrary, it's a misconception to think people are egotistical or bad. Most people are decent

folk, as Rutger Bregman explains so well in his book. The chokehold isn't because of the bad guys. Nearly everyone thinks they are doing the right thing. That includes the people cutting down rainforests and drilling for oil. Why do they do it? People want to belong to a group and achieve a certain status within that group. In science, you achieve status by publishing articles in *Nature* and *Science*. In a company, you achieve status by making a profit and keeping the shareholders satisfied. In our society, status is linked to money and material objects. We have become obsessed with striving for things that don't ultimately make us happy. But that is a very recent development in human history. We didn't evolve to have material things. Hunter-gatherers don't have material things. So it doesn't have to be this way. We evolved to function well in small groups. The biggest challenge for mankind is scaling up from small groups to the global scale. Life could be so much better without having to make any sacrifices. That is the picture I present.'

‘MANAGING THE CLIMATE IS TOO IMPORTANT TO LEAVE TO POLITICIANS’

‘WHY IS NOTHING HAPPENING, AND CAN WE DO ANYTHING ABOUT IT? THAT IS THE QUESTION ADDRESSED IN THIS BOOK’

In the book, you make several radical proposals for speeding up the transformation, including a ban on advertising. How realistic is that?

‘These are thought experiments for when the time is ripe. I present a panorama of conceivable examples. In the past, the function of advertising was to give you information about products, but these days everyone can find that information on the internet. Now, all advertising does is lead to overconsumption. Advertising should be illegal.’

And an independently operating global climate organization?

‘Managing the climate is too important to leave to politicians. I'm proposing climate boards, hierarchically organized at the regional, national and international levels, analogous to the water boards in the Netherlands. Even in the Middle Ages, people thought dry feet and sturdy dykes were too important to leave to scheming politicians. The same applies now to the climate.’

Billionaires giving away their money?

‘The fact that a small group of ultra-rich people have so much influence is a huge problem. They have taken over markets, governments and the media. That is one aspect of the invisible strangling hand. The solution is that no one should be allowed more than 10 million euros. Of course, most rich people will be opposed to this redistribution of wealth. So we should let them do it themselves, as long as they report back. Accept their power, but introduce transparency in how that power is used. In other words, a kind of United Billionaires rather than the United Nations, which no longer works anyway.’

You are 67. Will you live to see that transformation?

‘Yes, I think I'll see quite a lot of the transition. The instability in the world is accelerating, there is a growing sense of urgency and a realization that things need to change. I believe a lot is going to happen in the next few decades.’ ■

NOBEL PRIZE

If there was such a thing as a Nobel Prize for Ecology, the name of Marten Scheffer (Amsterdam, 1958) would be among the list of prime candidates. At least, that's what ChatGPT says, summarizing the information on the internet. But there is no such prize. Scheffer did get awarded the Spinoza Prize in 2009. He is the only Wageningen scientist still working who has received that prize. Scheffer graduated with distinction in Biology at Utrecht in 1985 and received his PhD there in 1992. After several other jobs, he became professor of Aquatic Ecology & Water Quality Management at Wageningen in 1998. He is not only an eminent scientist but also a talented musician, playing the violin, mandolin and guitar among other instruments.. The artwork *Must Leave* in the Orion pond was commissioned by him.

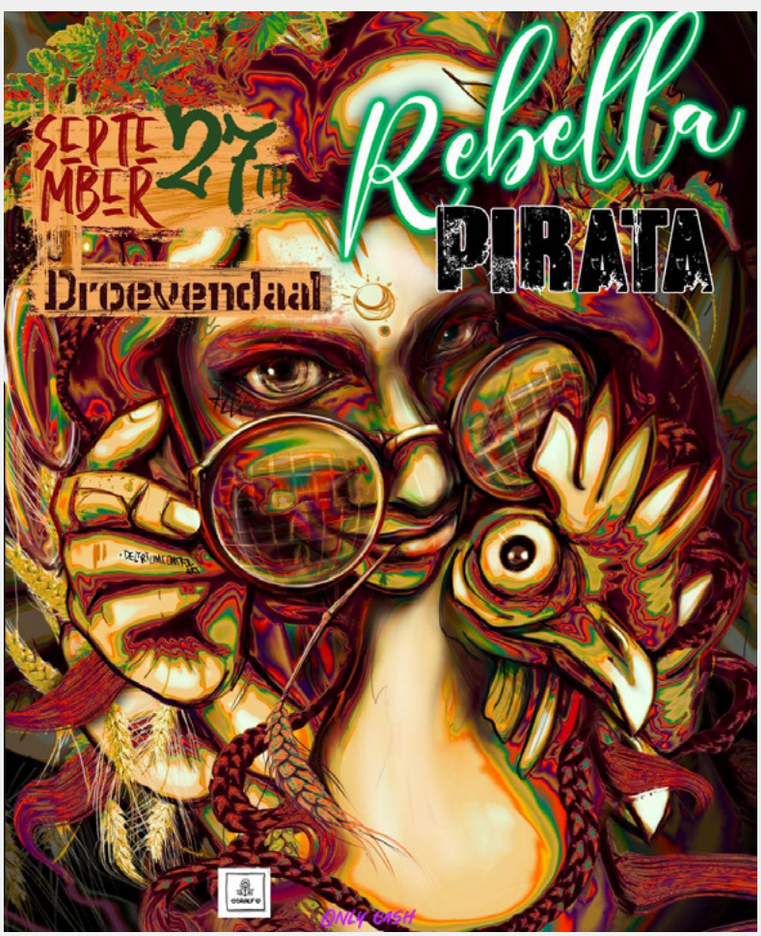
Limelight

In late September, Droevendaal will be showcasing female performers during the Rebella Pirata festival. This feminist event will be coming to Wageningen for a day of live music, art and dance.
Text Coretta Jongeling

SAT
27-09-25
Algemene Barak, Droevendaal
16:00 – 0:00
Admission: donations

Rebella Pirata

The Rebella Pirata organization was set up over 10 years ago. It aims to promote female performers, mainly in the underground dance scene. 'We want to create a safe place for women to make art and music and to be together,' explains Elena Bayo, one of the organizers. 'Male performers still find it much easier to get gigs than women. We want to change that.' The event is open to everyone, stresses Bayo. 'Of course it's not women only; everyone is welcome.' Rebella Pirata has its roots in the squatter movement. This will be the first time it is coming to Wageningen. The programme will feature DJ Purita D, Pine Dub and Ana Rebel, an exhibition of graffiti art, a dance show, a market with hand-crafted objects and a performance by the jazz artiste Janis May.
There is no admission charge but there will be a box for donations. 'We don't make a profit. We will use the donations from this festival to organize a bigger event at the end of the year. The money we make from that will be donated to a women's organization. To give an example, on a previous occasion the proceeds were donated to a foundation that helps women to get an abortion who are from countries where that would be illegal.'



TIPS

Saturday 13 September
Molenmarkt ▪ *Wageningen products, live music* ▪ Molen de Vlijt

Saturday 4 October
Drag Night ▪ *Dancing and shows* ▪ Shout, De Wilde Wereld

Friday & Saturday 10/11 October
Over Yonder ▪ *Music festival* ▪ De Wilde Wereld

LOOK!

You can spot great-looking people and cool outfits on Wageningen campus. This column highlights some of them. This time, meet Bioinformatics Master's student Dennis Vlegels (25).

Text and photo Eva de Koeijer

'I've experimented a lot with my style over the years. I wouldn't wear now what I used to wear five years ago. These days, my clothes are pretty unique because I buy everything second-hand or make it myself. Making my own clothes is a hobby I started with my flatmate during Covid that got a bit out of hand. The dungarees I'm wearing now, for example, I made myself. My flatmate made my bag and this shirt was one he created too. We keep things sustainable this way.

'I think people who see me will expect me to be open and extrovert. My clothes send a message that I'm not afraid to stand out. But there's a negative side to standing out: people shout "gay" sometimes and recently someone even spat in my face. Despite that, I still wear what I want.

'Fortunately, most comments are positive. Sometimes, an outfit will even prompt an unexpected conversation with someone, which I love. If I see someone wearing something cool, I also like to say something nice to them. In fact, I'm often looking at who I can "copy"; everyone around you can be a source of inspiration.'

You find all the flavours of the world in Wageningen. Kamila Kopečná (21), an exchange student from the Czech Republic, shares a recipe for *svatební kolacky*, 'sweet wedding buns'.

Flavours of WUR

Svatební koláčky

'Despite the name, I never ate these buns at a wedding. These pastries are mainly eaten during a folk festival in the southeast of Moravia. During this festival, people dress up in traditional costumes and construct a *mája* or maypole to dance around. This is my grandmother's recipe. This version is with quark, but you can also use raisins, walnuts or another filling.'

Ingredients (For 40 buns):

For the dough:
- 500g fine flour
- 7g dry yeast
- 140g sugar
- 250 ml milk
- 140g butter
- Pinch of salt
- 2 egg yolks

For the filling:
- 400g of quark (not too watery)
- Vanilla sugar and sugar, as much as you like

For the crumble:
- 50g flour
- 50g sugar
- 50g butter
- One egg, beaten

Preparation

1. For the dough: warm the milk and mix it in a bowl with the yeast and one third of the sugar. Wait until the mixture starts to rise.
2. Combine the flour, the rest of the sugar and a pinch of salt. Add the egg yolks and the milk-yeast mixture. Mix well. Melt the butter (but don't let it get too hot) and add it. Keep mixing until the dough is no longer sticky. If it is still too sticky, add a tiny bit of flour; if it is too dry, add a tiny bit of milk.
3. Let the dough rest and rise until it doubles in size (approx. 1 hour).
4. Make the crumble. Use a fork – or your hands – to mix the butter, flour and sugar.
5. When the dough has risen, split it into 40 pieces. Shape into small patties.
6. Mix the ingredients for the filling. Put a teaspoon of filling on each patty. Then wrap the patty around the filling and put it on a roasting tray.
7. Brush the buns with the beaten egg and sprinkle the crumble on top.
8. Preheat the oven to 170 degrees Celsius.
9. Bake the buns until they are golden (approx. 20 minutes). Enjoy!

Kamila Kopečná
Exchange student

Column
Willy Contreras-Avilés

A courageous life

With the beginning of the 2025-2026 academic year, I want to welcome the brand-new Wageningers with a message of hope and resilience.
The Italian journalist and writer Oriana Fallacia argued that every aspect of life is about war. Therefore, she accepts war and fights it with the power of thinking expressed through words. It is a daunting challenge to work out whether our thinking comes from the power of our own reasoning or is just a repetition of imposed ideas and circumstances.
To the new Wageningers, I urge you to take the opportunity of being here to question, think and rethink. Challenge your own ideas, as well as those of others. Unlearn old paradigms and learn new ones.
The concept of war is indeed a reality we should not disregard. Some wars are more individual, while most are part of complex systems that steer our societies. For instance, in the terrifying times we live in, it takes courage to carry on living a life where we condemn oppression without retaliation. It takes courage to do an academic degree in another country. It takes courage to say no and disagree with your supervisor. It takes courage to report the undesirable behaviour of a classmate. It takes courage to point out the hypocrisy and incoherence of your university. And, while not comparable but still utterly important, it takes courage to denounce a genocide and demand a free Palestine once and for all.

Willy Contreras-Avilés (36) is in the final year of his PhD research on the biochemistry of medicinal cannabis. He comes from Panama. He likes to dance (*perreo*), cook Italian food and swim.

Meanwhile in...
Sudan – a humanitarian crisis

WUR is incredibly diverse, with hundreds of internationals working and studying here. In the *Meanwhile In* column, we ask one of them to comment on events in their home country. Master's student of the Governance of Sustainability Transformations Omnia Elgunaid Hassan Mustafa (22) shares her thoughts about the ongoing humanitarian crisis in Sudan.

Text Machteld van Kempen

‘Sudan is experiencing the biggest humanitarian crisis on Earth right now with over 15 million displaced people. There’s also a famine, the worst in 40 years. The media often uses the term “the forgotten war” when talking about Sudan. But what do they mean by “forgotten”? We, the people who are experiencing it, are not forgetting anything. The world is choosing to forget. Other countries evade accountability and label it a civil war and an internal conflict, even though it has become a proxy war with many countries involved. It’s actually a very lazy way of reporting that relies on dehumanizing language.
‘It’s hard being here because it feels like you don't have a backbone anymore, there is no home country to return to. I have a lot of survival guilt following what is happening in Sudan from here and I find it hard to keep up with the news. So there’s also the guilt of not caring enough about it.
‘If there was no conflict back home, my experience here would be very different. In a way I wish I could have come here with no worries, no traumas, be normal like other people and go back to my country for the holidays. But at the same time, I'm also kind of appreciative of the challenges that I had to face and come out of.
‘Living here, I long for a community of others who understand conflict first-hand. When I talk about it with normal people, they always shy away from the subject and they don’t know what to say.
‘I also wish people would see Africans as worthy of saving, like everybody else. I wish that people would stop treating our lives as disposable, as if it’s just another African conflict. But Africa is a real place with real people who have dreams, aspirations, families and loved ones.’

Advertisements

Colophon

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Photo Marte Hofsteenge

OcSober is forecast to be dry

The R is in the month again. The R that's also in dRink, dRugs and cigaRettes. One of those addictions has had its own autumn campaign for a while: Stoptober to stop smoking for a month. But there are so many other things you can stop doing, say Wageningen's student societies. Now they are introducing OcSober to stop people drinking alcohol.

The student societies and sports clubs will stop serving alcohol for the entire month of October. With the slogan *Be a Hero, Stick to Zero,* students are being challenged to examine their own alcohol consumption. The initiator is Bob Bras of the KSV debating society Triple. He had the idea while suffering from a hangover after an evening boozing.

Third-year student Bob admits he normally likes a glass or two. 'But the hangover was a really bad one this time. Triple what it normally is, you could say. I can't remember what happened beyond half past eight at all. I woke up the next morning with my head in the flower pot my mum gave me.'

Anyone ordering a beer next month at a club bar will be served tap water. If they try to order beer twice, they will get a yellow card. Three attempts and they will be banned from the premises for the rest of the month. The societies and clubs are taking this seriously. Incidentally, the tap water will cost as much as a beer. Got to fill those coffers.

Initiator Bob Bras of the KSV debating society Triple had the idea while suffering from a hangover after an evening boozing

Student psychologist Jan Bols warns of the social costs of a dry month. 'Look at the US, where Prohibition led to Al Capone. If students can't get smashed at the club bar, they'll just do it at home instead. With the inevitable consequences.'

Bras doesn't think it will be that bad. After all, there is a really cool prize on offer for students who make it to the finishing line. Anyone who can prove they didn't drink a drop all month will get a free ticket to one of the extra performances in November of the *musical The NO-horn* in the Junushoff. In this show, creatures such as the KISS-my-ASS dog and OH-YES princess search for the mysterious NOWHERE. 'A spicy production for students who dare to dream,' says Bras enthusiastically. 'Seldom has grumbling been performed with such irresistible delight. At least, that's what Dutch newspaper *de Volkskrant* says.'