

WUR from within: straight, sharp, transparent

No 10

Resource

JANUARY 2021 VOLUME 15

Deforestation is complex
So is the solution

Researchers extract
DNA from ancient wood

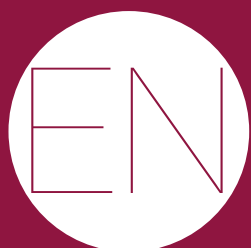
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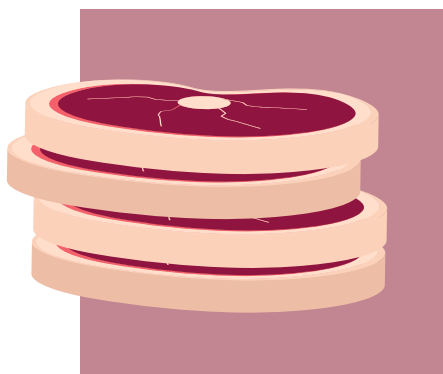
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FOREWORD

Wild encounter

Teacher Koen Arts slept in a tepee for 365 nights to restore his rather diminished bond with nature. He described what he gained from the experience in his book *Wild Year*, which we met to talk about (see page 24). He would recommend sleeping outdoors like that to everyone. Except not just yet because of the lockdown – it's not allowed. Arts warns us against routine and comfort. Comfort makes you lazy and routine is boring. He's got a point. As a journalist on a local paper I once learned never to go home from an appointment by the same route I took on the way there. By doing so, you see twice as much on your journey. That's nothing to what Arts did, of course. But it does work – just try it. A change is as good as a rest. Turns out the outdoor life is addictive, by the way. Arts wanted us to hold the interview outside around a wood fire. In view of the temperature, I declined. There are limits, you know. Not that there's anything wrong with my bond with nature. 'Wild encounter' would have made a great headline.

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Roelof Kleis

Resource editor





WAFFLES

What do you do if you're on the committee running a nightclub that has been closed since last March? You really miss those parties, so you look for something else that means you at least have some contact with other people. Now De Bunker will be selling freshly made waffles every Tuesday between 12 and 4 pm. A perfect excuse to get out of the house — and the closest you'll get to a party on a Tuesday at the moment. [CJ](#)

Photo Sven Menschel

Student poll: 'More financial worries and more substance abuse'

Almost one in three students have financial worries caused by the corona crisis, says a report entitled 'Dear Mark', which combines the findings of three different surveys held among a total of 7750 students.

The report was written by students from Leiden, Delft, and Utrecht. They call themselves Students Research Together, the Dutch acronym for which is SOS. The group gets support from the national student organization ISO (Interstedelijk Studenten Overleg). Their report occasionally reads more like a cry from the heart directed at the prime minister ('Dear Mark') than a study. Their main point is that the lockdown is having a massive impact on students.

Some 1250 students were asked about their use of alcohol and drugs since the start of the coronavirus crisis. One in five has increased their alcohol consumption, one in ten uses more drugs, and 12 per cent do both.

One third of the students also report financial worries. They have either lost their part-time jobs or have seen their hours cut as a result of the Covid-19 pandemic. As for a higher student debt due to falling behind with their studies, this concern hardly gets a mention. The students offer suggestions too, calling for more student psychologists and more internships at government facilities and institutes. HOP



Aarzo Kohra (on the right) with a member of her Christmas activity group. Photo: Aarzo Kohra

Mini-group activities during winter AID

The AID will mainly take place online, supplemented with one-to-one activities.

During the AID (general introduction days), new students get to know each other, the university, and Wageningen town. This year's winter AID takes place from 8 to 14 February. Because of the Covid-19 pandemic, it will mainly be online, supplemented with activities done in small 'activity groups' of about six students which can split into smaller subgroups to do activities.

'It was great to meet new people: we still see each other'

The idea of activity groups arose in the run-up to the Christmas holidays, says Lisa Nguyen of the Student Service Centre. At the start of the week, each activity group was given a bag full of packets containing the things they would need for the activities, which were organized by study associations and student societies. 'Mercurius Study Association, for example, came up with two activities,' says Nguyen. 'Sending Christ-

mas cards to elderly people, and a film evening. So the bag contained a packet of Christmas cards, felt pens, and a packet of crisps and a drink for the film evening.' Other associations organized things like a meal to cook yourself; a pub quiz; walks around Wageningen; and Dutch *oliebollen* for New Year's Eve.

Just like Christmas

The Covid measures in place during the Christmas holidays allowed you to have two visitors and to meet one person outdoors. Depending on the rules in force during the period of the Winter AID, new students will be able to do indoor and outdoor activities in small groups and subgroups.

One of the 180 students who took part in the Christmas activity groups was Aarzo Kohra (23), an MSc student of Plant Sciences. 'It was great to meet new people and to carry out tasks together. We still see each other, sticking to the Covid-19 guidelines of course.'

About 80 people have signed up for the Winter AID so far. The programme will be announced around 1 February. LZ

535

That is the sum in euros (three months' tuition fees) that MSc students who graduate by September will get. The cabinet thinks many students will get behind with their studies and is therefore refunding all graduates this academic year 535 euros. The Dutch national students' organization ISO approves but says the amount is too low: 'Every month's delay costs the student at least 1000 euros extra,' says chair Dahran Çoban.

Regional produce for sale

Last summer, a team of WUR students called *Freeze 4 Ease* won the *From Farm to Fork* hackathon with their idea for freezing local products and selling them on the campus. The kick-off is planned for 3 February at 11 am, when sales will start. But instead of locating a freezer on the deserted campus, the students have joined forces with the shop *Vreemde Streken* at Junusstraat 47. The freezer will be located there, and frozen soups, apple pie and locally grown vegetables can be bought from it. 'We want to combat food waste, shorten the supply chain, and give farmers a fair price for their products,' says Maaïke Hes of *Freeze 4 Ease*. 'Locating the freezer at a central spot gives a lot of people access to healthy, locally produced food.' 🍷

Typical Dutch Important 'dis' words



Illustration Henk van Ruitenbeek

When I started on my Master's at Wageningen University, I noticed that two words that start with 'dis' play an important role in the life of Dutch. The first is discussion. I hadn't been in Wageningen long before I understood that discussion is a crucial part of life in the Netherlands. The Dutch really love a long discussion, particularly during group work. Although I see dis-

cussion as a source of new ideas and perspectives, when it goes on so long it can be a waste of time. In one group work session, we spent three hours discussing a single word in the assignment. To be honest, I thought this was insane because this word was not even related to the research question or important for the assignment. Basically, this word made no difference to our report. On the other hand, as a result of the brainstorming during the discussion, I have more idea of what other people think about the topic and how we can handle a topic from different perspectives. This helps to widen my horizon as well!

'My group once spent three hours discussing a single word'

The second important word in the Netherlands is discount. The Dutch really like a discount in the supermarket.

Even if it is very small, they will go for it. The first time I went to the supermarket with my Dutch friend, I realized that he was looking for food that was reduced in price. He headed straight for the coloured labels, although the discounts were just a few cents. Of course, everyone likes a discount, but I think Dutch people like one a bit more!

So after the learning process I went through, I have adjusted to living with these Dutch priorities, and I love them!

Do you have a nice anecdote about your experience of going Dutch? Send it in! 300 words max. Send it to resource@wur.nl and earn 25 euros and Dutch candy.

This Typical Dutch was sent in by **Tolga Ayeri**, an MSc student of Environmental Sciences, from Turkey.

Criteria for degrees in English

University degree programmes in English must meet at least two of five criteria, according to draft rules that the Education minister Van Engelshoven presented on 15 January. The Upper House of Parliament has its doubts about the proposal.

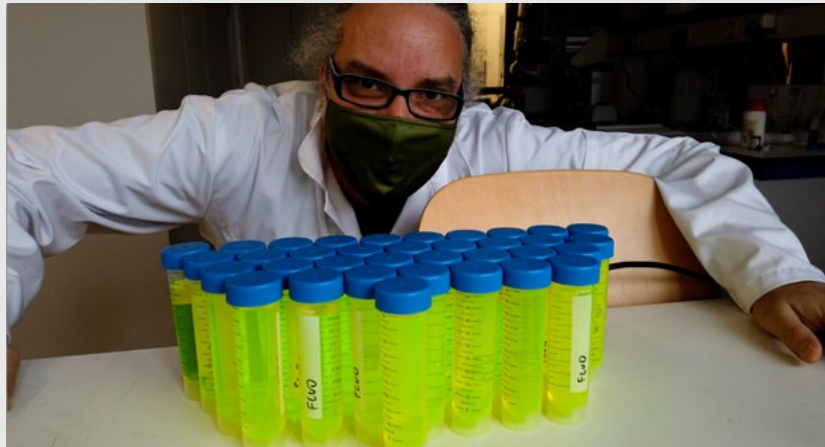
The proposed rules implement the Language & Accessibility bill, which was passed by the Lower House. If the Upper House also votes in favour, the new rules will take effect on 1 September. But the Upper House may label the bill 'controversial', which means it cannot be dealt with by the current caretaker government.

According to the rules, degrees in English will have to meet at least two of the following five criteria:

- 1 the programme has an international focus;
 - 2 the labour market is international;
 - 3 intercultural exchange is a requirement;
 - 4 there is a lot of collaboration with non-Dutch-speaking companies or universities;
 - 5 most of the lecturers are non-Dutch.
- All the Wageningen degree programmes seem to meet these criteria.

But it is not certain whether the Upper House will approve the new rules. The coalition parties VVD, CDA and D66 and the opposition parties GroenLinks and PvdA all have doubts about the legislation, as is clear from the written questions to the cabinet.

VVD fears that the legislation will result in 'administrative paperwork' because how do you assess the criteria? CDA calls it a 'paper tiger'. There is also criticism of the requirement that English-language programmes have to improve their students' command of *Dutch*. HOP



No practicals in the lab? At home then!

When his practical could no longer go ahead in the lab, assistant professor Vittorio Saggiomo (BioNano Technology) sent his students a mini-lab in a box so they could still carry out the practical themselves at home. 'I had to adapt the assignment a bit, because you are posting 40 boxes full of chemicals,' says Saggiomo. 'I left out the arsenic.' LZ

Media interest in Scheffer article

The second most discussed climate paper of 2020 was from Wageningen. This was 'Future of the human climate niche', co-authored by distinguished professor Marten Scheffer, which was published in *PNAS*.

The article describes the effect of climate change on global migration flows. Humans flourish within certain temperature limits, which have been constant throughout history. Because of global warming, the area with such optimum temperatures is shifting. According to Scheffer, about 3.5 billion people will be living in Saharan conditions in 50 years' time. Many people will want to migrate to avoid such conditions. The article attracted a lot of interest from the popular media. This is evident from the annual overview that the *CarbonBrief* website produces of the media attention

paid to climate science. According to its 'Altmetric score', there were over 3700 references to Scheffer's article, mostly in tweets although nearly all the world's major newspapers also wrote about this 'thought experiment' by Scheffer and his colleagues.

Incidentally, the Wageningen article is far behind the number one, a Covid-related paper on the reduction in CO₂ emissions due to the coronavirus pandemic. That publication attracted more than twice as much media attention as Scheffer's paper. See *Resource* 17, May 2020, for more on Scheffer's publication. RK

Deforestation is complex — as is the solution

What causes deforestation varies between regions, so the appropriate solutions also differ, argue the Wageningen geo-information and remote sensing researchers Martin Herold and Niki de Sy in response to a report by the World Wildlife Fund (WWF) on deforestation.

The WWF concludes that global forest cover is shrinking, with an area the size of the Netherlands lost to deforestation each year. Deforestation is a problem in particular in Brazil, Bolivia, Indonesia and Malaysia. In its press release, the WWF emphasizes soybean cultivation as a driver of deforestation, the imports of soy-based animal feed to Europe and Europeans' responsibility to

reduce the meat in their diet. That analysis is valid but not the whole story, says De Sy, who provided data for the WWF report.

Firstly, the EU is no longer the world's biggest soy importer — that

is now China. What is more, the cultivation of export crops is just one aspect of the problem: as the WWF states, EU imports of food and energy crops only account for 10 per cent of global deforestation.

'Many countries exploit the forests for development. Livestock farming, mining, logging — various economic sectors are using forested land,' says De Sy. 'And both large agricultural businesses and small farmers cut down trees.'

Herold studies deforestation in Africa. Satellite images show that in Congo in particular, deforestation has increased recently. This is mainly due to small-scale illegal logging and tree felling by local groups. Congo needs stronger government action on forestry management and enforcement plus fast satellite imaging in order to combat illegal logging, says Herold.

He believes the focus in tackling deforestation should be on sustainable land use. While a reduction in large-scale soybean and palm oil cultivation can be a part of the approach, sustainable agriculture, reforestation and landscape restoration are also important. *AS*

'Many countries exploit the forests for development'

Responding to climate change

A top 5

The Netherlands organized the Climate Adaptation Summit 2021 at the start of this week. The main question at this online conference was how countries can best respond to climate change. Here's a top 5 from Tim van Hattum, Climate programme leader at WUR.

1

Natural coastal protection

This is about building with nature – projects that combine coastal protection with nature development. Like the sand motor off the Dutch coast, oyster reefs in Bangladesh and mangrove forests in Indonesia. The idea: flexible coastal protection grows in step with rising sea levels..

2

Restoration of wetlands and room for rivers

Raising the water level in peatland areas around the world, such as the Netherlands and Indonesia, to reduce CO₂ emissions and create wetland nature reserves at the same time. And capturing more fresh water by restoring wetlands and streams or creating room for rivers.

3

Green cities

Making cities greener to combat flooding and overheating, for instance. With more trees and parks, say, or smart green roofs and urban farming.

4

Climate-smart agriculture

For example, sustainable soil management with a higher level of carbon sequestration, smarter irrigation systems that cope better with water shortages and surpluses, and the development of salt- and drought-tolerant crops.

5

Adaptive delta management

Long-term plans for adapting water management to changed climates, such as the delta plans in the Netherlands, Bangladesh and Vietnam. *AS*

See also: magazines.wur.nl/climate-solutions



A little wiser

Does the five-second rule work?

You're chopping vegetables in the kitchen when a slice of cucumber falls on the floor. No need to panic: according to the five-second rule you can eat it if you pick it up fast enough. Or not?

There is a grain of truth in the rule, says food microbiologist Gerrieke van Middendorp. 'How many bacteria land on the food is partly a matter of time, but there's no cut-off point at five seconds.' So how fast do bacteria travel? 'Unfortunately, the bacteria don't have to travel. When a piece of cucumber touches the floor, it is full of bacteria in a fraction of a second.'

Bacteria get transferred faster to moist food. The structure and acidity of the food make a difference too: most bacteria prefer sweet things to sour. 'if a little one-centimetre cube of watermelon falls on a tiled floor which houses about 100 bacteria per square centimetre, 90 per cent of the bacteria are on the melon within one tenth of a second. But for a slice of bread that does take longer than 5 seconds.

The type of floor makes a difference too. 'More bacteria stick to your food if it's a hard floor than if it's carpeted, assuming the two floors are equally clean. In theory you can keep a hard floor cleaner, but does that actually happen? And are

there any pets? Because some bacteria multiply on the animal's body too.'

Children put things in their mouths all the time, which rarely has fatal consequences. It's good for their immune systems, isn't it? 'It usually turns out okay. But there are some pathogens, such as particular strains of *E coli* and *Salmonella*, which can make you sick with small numbers of bacteria. You can never completely avoid ingesting bacteria, and that is not desirable either. We can't make our lives sterile, but it's not an option to go back to the times of open sewers either. Somewhere between these two extremes there's a happy medium.'

Conclusion: It's better not to eat a piece of melon off a dirty floor. But you should get away with eating a dry biscuit off a clean floor. If in doubt, apply the zero-second rule. TL

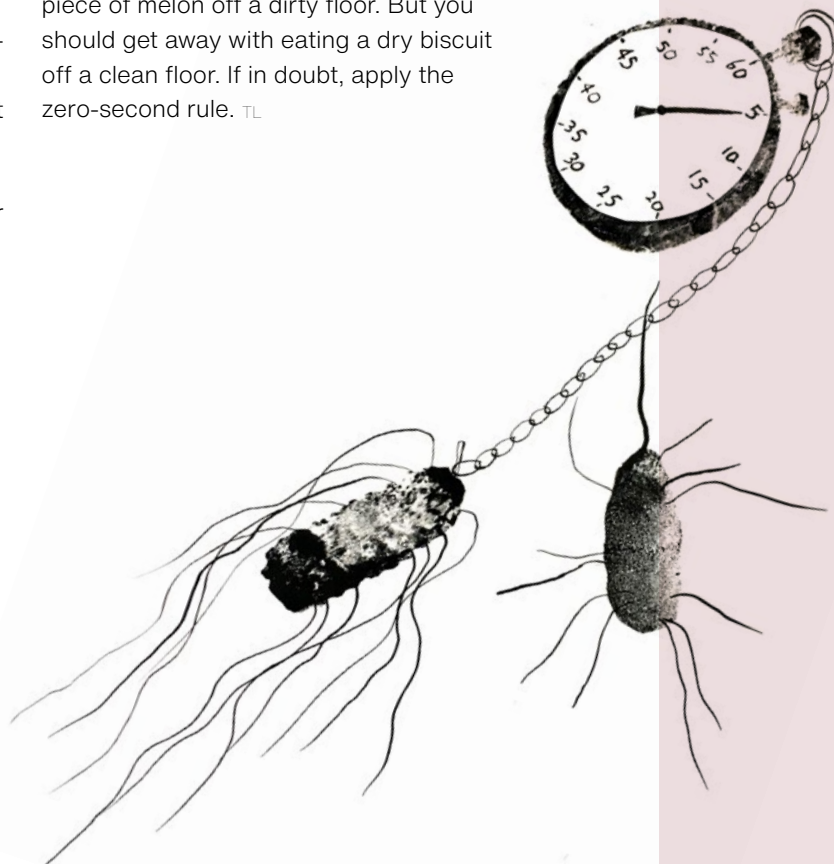
'More bacteria stick to your food on a hard floor than on a carpeted one'

Gerrieke van Middendorp,
food microbiologist

Every day we are bombarded with masses of sometimes contradictory information on pressing issues. In this feature, a WUR scientist gives you something to hold on to. What are the facts of the matter?

Every question makes you a little wiser. Do you dare to ask yours? Email us at redactie@resource.nl

Illustration Marly Hendricks



Detecting drugs with a mobile phone

The police in the Zuidas neighbourhood of Amsterdam may soon be walking around with a scanner in their mobile phones to help them detect cocaine.

The scanner owes its existence in part to researchers Yannick Weesepeel and Martin Alewijn at Wageningen Food Safety Research. They worked with the Amsterdam Police, the Netherlands Forensic Institute



shutterstock.com

and other parties to develop a cheap scanning application for detecting drugs, in this case, cocaine, on the street. The app not only reveals the presence of cocaine but also measures the concentration. 'The advantage of that is that you can detect a lot of different substances. Our colleagues use it, for instance, to measure sugar levels in fruit to see how sweet it is. And it could be used for other drugs as well.' Weesepeel does not know yet whether the app will go into production. ^{TL}



Underground sex

Worms display 'maternal love', shows Wim van Egmond's latest time-lapse video. The microphotographer has been working for years with Wageningen soil scientists to record what goes on in the underground world of worms. Producing not just stunning shots (like this mating *Aporrectodea caliginosa*) but also scientific findings. After mating, the worm creates a nursery (a tunnel) and lays its 'egg' (a cocoon) there, tucking it in carefully. 'We had no idea they did it like this,' says worm expert Jan-Willem van Groenigen with enthusiasm. True 'mother love'. In quotes, since worms are hermaphrodites. ^{RK}

Diets affect the microRNA in fatty tissue

PhD candidate Charlotte Michielsen of Human Nutrition and Health discovered this.

Michielsen compared the effect of two restricted energy intake diets designed to help you lose weight. The diets differed in quality: the high-quality diet contained more nutrients known to have a positive impact on health. However, both diets had the same number of calories. Michielsen: 'You'd expect the weight loss to be the same for both groups, but that was not the case.' The high-quality diet resulted in more weight loss (an average of 8.5 kilos as opposed to 6.2 kilos).

The researchers could explain some of that difference 'but that still left a gap of 1.2 kilos that we couldn't explain,' says Michielsen. 'Apparently the saying "once past the lips, forever on the hips" is not always true.'

Michielsen investigated the trial

'Apparently "once past the lips, forever on the hips" is not always true'

various types of microRNA in the fatty tissue.' MicroRNA is short sequences of transcribed DNA that influence processes in the body. Some of the microRNAs were expressed more and

subjects' fatty tissue. 'We found that the quality of the diet and the weight loss affected the expression of

some less compared with a normal diet; some only changed with the high-quality diet and others only with the low-quality diet.

Effects

'Associations have been found between abnormalities in the presence or expression of microRNA and certain kinds of cancer and cardiovascular diseases,' says Michielsen. 'However, this is a new field in nutrition research.' Michielsen cannot yet say whether the microRNA explains the differences in how people respond to a diet. Too little is known about microRNA as yet for that. 'We hope eventually to be able to measure the effects of nutrition on the body based on the changes in microRNA expression.' ^{TL}

Progress on extracting resources from wastewater

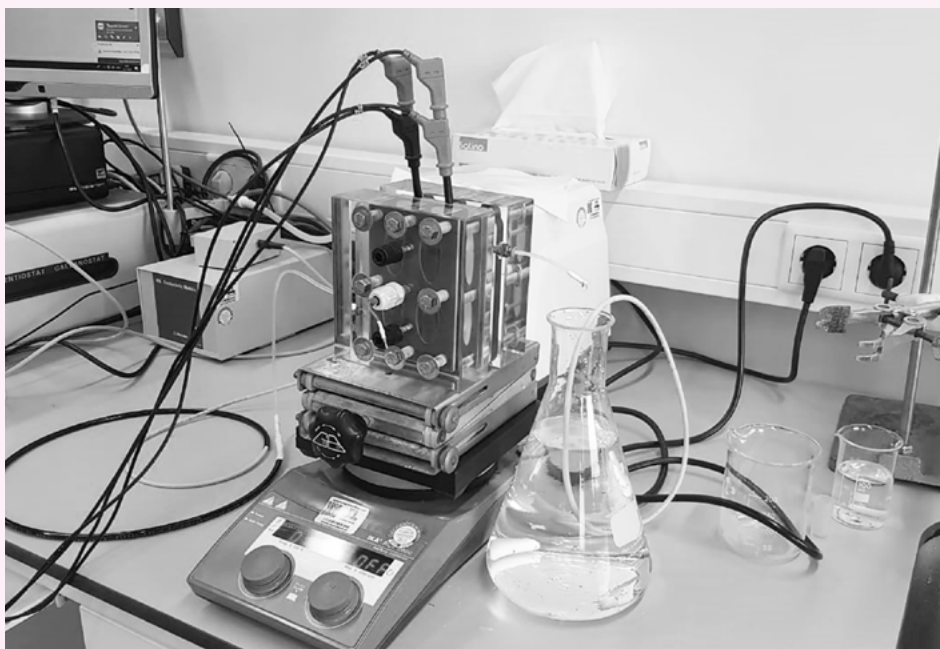
WUR researcher Louis de Smet and his group are working on advanced purification systems for extracting resources from wastewater. The separation techniques are becoming steadily more selective.

De Smet, who works in the Organic Chemistry lab, is using an existing technique to desalinate water using electricity. If you dissolve salt (NaCl) in water and run it past two charged electrodes, the positively charged Na^+ goes to the one and the negatively charged Cl^- to the other. You can capture all the salts like this to obtain fresh water. But for De Smet, the water is only a by-product. His main aim is to fish specific molecules and salts, such as phosphate and lithium, out of the water in a pure form.

To desalinate water with this technique, electrodes in the form of carbon plates

‘We don’t yet have a membrane that allows phosphate through specifically’

are usually used. The carbon is porous and has a large surface on which to store charged salt particles (ions). Once the carbon electrode is full of salt, you switch the poles around and it will release the salt again. This enables you to reuse the electrodes repeatedly.



De Smet's experimental setup. Photo Jayaruwan Gamaethiralalage.

Now De Smet wants to capture specific salts, and researchers are playing with things like the strength and duration of the electric field between the electrodes, and with the speed at which the water is pumped past the electrodes. They are also looking for membranes that allow the specific salts to pass through, and for alternative electrode materials with pores of a better shape and size.

Separation

The first steps have been taken towards combining two kinds of electrode material and a membrane in this kind of selection process, writes De Smet this month in the *Chemical Engineering Journal*. This will enable the researchers to separate double positive ions (such as calcium/ Ca^{2+} and magnesium/ Mg^{2+}) from single ions such as sodium/ Na^+ .

There has been no success yet, however, with isolating pure phosphate from wastewater. Phosphate is difficult because it is a large ion and if the electrode attracts it, smaller salts come with it too. ‘We don’t yet have a membrane that allows phosphate through specifically, although we are making progress in that area,’ says De Smet. This is likely to require a purification process involving several steps and techniques to make it sufficiently selective.

The same applies to the process of fishing lithium out of wastewater. Lithium, used in batteries, is a small ion. You should be able to extract this ion from water with the right pore size in an electrode or membrane, says De Smet, but this too requires several techniques to work in tandem. **AS**

Honesty

The Dutch Prime Minister Mark Rutte and his third cabinet have fallen over the benefits affair and have got to explain to the Lower House of parliament how things could have gone so wrong. There are already numerous theories about why the government was able to crush these families in its bureaucratic machinery so terribly. The most interesting feature of the case is that everyone – from the minister to the most minor civil servant – collaborated in the system without a murmur, while they now say they had an uneasy feeling about it. How can everyone in a large organization join forces on something

'We never go along with groupthink, making us do things that don't feel right'

when each individual feels it's not quite right? How is it possible that an employee thinks 'There's something odd about this'; or even 'this is totally wrong', but that nothing changes because nobody else says anything, or even worse, everyone seems to think it's normal and points



Guido Kamps

the finger at someone else. A kind of bystander effect within the organization, whereby everyone does nothing as they wait to see what others do.

Luckily, we're working at WUR and not for the benefits department in the tax office, so we don't have to weigh up these kinds of considerations. What's more, WUR employees signed the integrity code, pledging to act in accordance with the letter and the spirit of this code. We need never doubt how we should act, because article 1 of the code states: 'Honesty means, among other things, reporting the research process accurately'. So we never get carried along in that kind of groupthink, making us do things that don't feel right.

I've got to finish off this column quickly now because it's the end of the month and I've got to record my hours. No matter that it's 10 pm, because I've been working on various grant applications for weeks, on weekdays and at weekends. I'd better have a quick look at the instructions on time recording so that I fill in exactly 40 hours for the work I've done this week on the projects I'm involved in.

Guido Kamps (37) is a researcher at Human Nutrition and at OnePlanet. He enjoys baking, bee-keeping and unusual animals.

Money from Brussels for more birds and flowers

For the first time, EU countries can now decide for themselves which environment- and nature-related goals they want to use European agricultural subsidies to achieve. WUR researchers Robert Baayen and Anne van Doorn are providing the basis for the Dutch climate and nature plan for agricultural land.



Text Albert Sikkema

Baayen and Van Doorn recently published a memorandum called 'Intervention rationale for the green-blue architecture of the CAP' for the Ministry of Agriculture, Nature and Food Quality. The ministry can use this memo in drawing up a national strategic plan for the new Common Agricultural Policy, paying more attention to climate and nature.

How much money does Dutch agriculture get from Brussels?

Baayen: 'About 900 million euros per year, about 700 million of which is income support for farmers. The Dutch government can spend the other 200 million on rural development. Of the 700 million, 30 per cent is allocated on condition that farmers meet certain green criteria. That will stop and instead, farmers can subscribe to an 'eco-scheme'. About 25 per cent of the support funds will be reserved for that scheme instead of standard income support.'

Which of the green targets do you want to spend that money on?

Van Doorn: 'The EU talks about three targets: climate, environment, and biodiversity & landscape. We have analysed the Dutch situation and we think that the Netherlands would be best off prioritizing biodiversity & landscape. There is already a lot of action on climate goals in the Netherlands, and we think the environmental issues should primarily be tackled with legislation and not with subsidies.'

What nature goals do you have in mind?

Baayen: 'We are thinking of subsidies for maintaining hedgerows or wooded banks, ponds, nature-friendly field

margins and waterway banks. These landscape elements are refuges for birds, wild plants and insects, so this way you promote biodiversity, which is deteriorating fast in the Netherlands.'

Van Doorn: 'Hedgerows benefit biodiversity directly, but we should also think about improving soil health and reducing drought and overfertilization. Wetter agricultural and nature areas with less nitrogen and phosphate pollution strengthen biodiversity.'

You want to support measures that improve climate, nature and the environment at the same time?

Van Doorn: 'That's right. We want to sup-

'We want to strengthen biodiversity and circular agriculture throughout the Netherlands'

port flower-rich field margins, because they are good both for biodiversity and for the soil quality in the form of CO₂ sequestration. Hedgerows capture CO₂ as well, so they are good for the climate too. On the other hand, you should be careful about locating solar farms on agricultural land. They are good for the climate, but they are a disaster for biodiversity. And we're also against large-scale subsidies for crops planted after the main crop to capture excess fertilizer from the soil. That practice somewhat fits the environmental goals, but it doesn't produce any biodiversity.'

But surely there is already funding for agricultural nature management?

Van Doorn: 'Farmers can already apply

for funding for nature management collectively. This system will remain, and it is useful, but it concentrates on a limited number of species — mainly field and meadow birds — in a limited agricultural area. If the surrounding land doesn't offer a good habitat for these species, you don't solve the problem. We want to strengthen biodiversity and circular agriculture throughout the Netherlands. For that purpose, an eco-scheme is ideal, because every farmer can take part in it.'

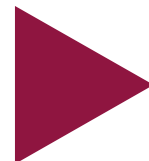
And what do you want to do with the peatland areas?

Baayen: 'With the current low groundwater levels, these areas emit too much CO₂. but if you raise the level, agriculture becomes unprofitable and needs financial support. In the new CAP, you

can fully compensate the farmers for the negative impact of this. That's a golden opportunity for the climate. But the point is: that support comes out of the 700 million for general support, and you're allowed to use some of it for subsidies for this specific purpose. Which is only allowed after 2022, incidentally.'

How do you want to compensate the farmers?

Baayen: 'We want an eco-scheme that is open to all farmers. Ecological subsidies have always come with a dogma: you were only allowed to compensate farmers for additional costs or lost income. The EU is



Greetings from Brussels



For the first time, EU countries can decide for themselves which environmental and nature targets they use European agricultural subsidies to aim at. Photo Shutterstock



Robert Baayen



Anne van Doorn

‘The landscape will become part of the farmer’s business model for the first time’

‘We argue for a points system in which farmers can collect points to qualify for a subsidy’

letting go of that dogma for landscape elements such as wooded banks and ponds that are not profitable for the farmer. We suggest that farmers get generous compensation for those elements. That will make the landscape part of the farmer’s business model for the first time.’

How do you plan to make sure there are more insects and birds?

Van Doorn: ‘The simplest answer is: more flowers. The Dutch landscape is getting more and more monotonous, with English ryegrass, maize and potatoes. It could be more diverse, and flowery field margins and herb-rich meadows would help.’

Baayen: ‘The question is how do you do it. Are farmers going to farm extensively on their whole farm or free up some of their farmland for nature and intensify the rest with precision agriculture? Both approaches are possible.’

Van Doorn: ‘The point is, though, that we won’t solve this just with nature management in nature areas. Something’s got to be done on agricultural land as well. We now have a farming system that targets maximum production, and everything is geared to that. We are hoping for circular livestock farms with mixtures of grass and clover, which might produce less but would create a healthier agro-ecosystem, and for arable farms that get a good income from crop diversification and strip farming.’

Do you reckon to solve the nitrogen problem this way too?

Baayen: ‘You can also use the eco-scheme to reduce farmers’ nitrogen emissions, thus contributing to the restoration of nature. Take farmers near Natura 2000 areas, for example. We propose creating a link between the eco-scheme and the nitrogen accounting system that the Remkes Committee proposed. That would mean measuring nitrogen emissions on farms and rewarding reductions in nitrogen, while letting farmers decide for themselves which measures they want to adopt.’

Do the subsidies mean extra rules?

Baayen: ‘What we want is precisely a simple system that requires very little administration. That’s why we argue for a points system. Farmers can collect points with a hedgerow, a flower-rich field margin or a reduction in nitrogen emissions and for interventions that benefit field birds. Those points accumulate and when they have enough, they qualify for a subsidy. The great advantage of this is that the government uses a clear accounting system while the farmers get the space to make their own decisions. Other countries are already using this kind of points system for nature and there were pilots in the Netherlands with groups of farmers, with very promising results.’

Who is going to keep tabs on all this?

Van Doorn: ‘We need several robust indicators with which we can measure effectively, and which reflect the status of the nature accurately. We’re thinking in terms of an index of farmland birds such as lapwings and skylarks. But those indicators don’t cover everything. I think it would also be good to have indicators for insects and landscape elements, as well as for the environment and the climate. We want to know whether the CAP funds are being used effectively.’

You want a regional approach. Why?

Baayen: ‘What is needed varies per region. On higher sandy soils you get drought, in the clay regions much less so, and on peaty soils there’s a climate-related problem. Also, nature policy has been decentralized to the provinces so that’s where the expertise is, with the farmers, water boards and nature organizations clustered around them. That’s where the knowledge of the area is, and that’s where you can organize greening in a targeted manner.’ ■

Weeding

'I worked for two years for an online food magazine, as project leader and editor, which was a good fit with my degree in Food Security. But I got stressed out by the pressure I experienced there. So I pedalled back on the job and did a lot of meditation, took a mindfulness course and had cognitive behavioural therapy. I later realized that I was mainly fighting symptoms with these methods, and not tackling the cause: my job. Nevertheless, I did gradually recover. Once I was working full-time again, I realized that I wasn't happy spending day after day at a desk. I missed hands-on work. And it felt contradictory to be an expert in food security when I had no idea how to plant a potato.

'I decided to change my way of life. I gave up my job at the newspaper and emigrated to Scotland, where my boyfriend lives and works. I started work there on a small farm, among the chickens, crops and

Turning points: sometimes you spot them immediately and sometimes only in retrospect. In this series, members of the WUR community describe a decisive moment they will never forget. This time, research assistant Lin Batten, whose burnout prompted her to pack her bags and move to Scotland.

orchards. Weeding, sowing, planting, and turning compost. On a farm you see the impact of what you do on the food security of your own community straightaway. I find that incredibly motivating.

'I realized I was mainly fighting symptoms and not tackling the cause: my job'

As well as working on the farm, I work three days a week as a research assistant and administrator

for the Law chair group at WUR. My boss there has no problem with my working remotely and this situation gives me the perfect balance between theory and practice.

'In total I now work five days a week again. And although I put in long hours on the farm, especially in the summer, it doesn't feel like hard work. The new structure in my life has done me a lot of good and made life more meaningful, so I'm a lot happier. I get paid for the work I do on the farm in eggs, vegetables and fruit, so I depend on my work at WUR for my financial security. I can make ends meet easily, and I've got energy and inspiration again to start new things.' NVTWH



The five stages of the investigation

1

Divers take a sample from the 15-metre-long wreck that was found at a depth of only three metres off the coast of the Mönchgut peninsula.



WHERE DOES THAT WOOD COME FROM?

WUR researchers have succeeded in extracting and amplifying DNA from centuries-old wood. That genetic material can be used to determine the origin of the wood, adding a potentially powerful instrument to the toolkit of archaeologists and historians. An example is the wreck that was discovered in 2014 in the Baltic Sea off the coast of the small German town of Lubmin in Mecklenburg-Vorpommern. Studies of annual growth rings dated the timber used to the period 1292-1307. The likeliest source: southern Sweden. But is that right?

Infographic Pixels&inkt

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3

The analysis focuses on DNA from the chloroplasts. Characteristic fragments of the DNA are given a marker and are replicated using the PCR technique. These fragments function as a kind of fingerprint of the wood.

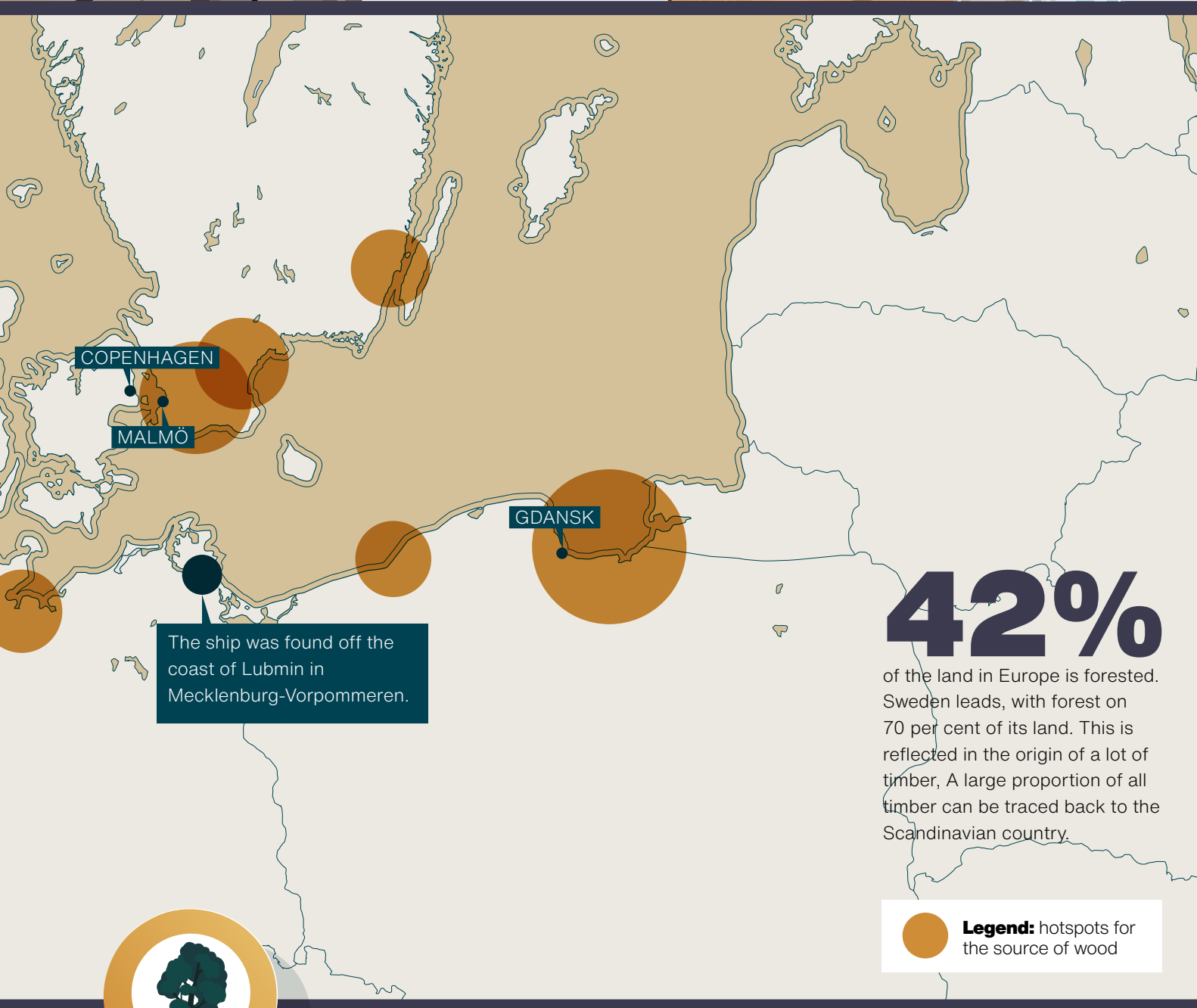
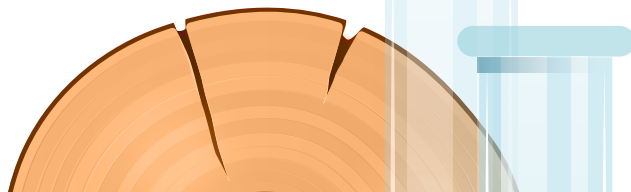
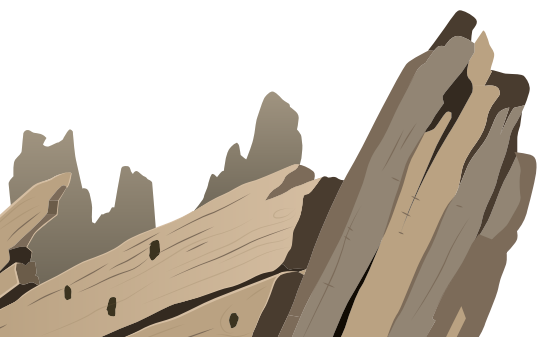
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The fingerprint, a unique combination of six markers, is compared with those in an existing database containing 32 fingerprints of oaks from different parts of Europe.



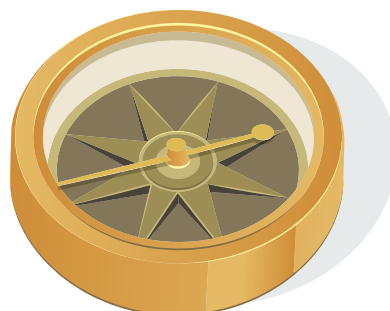
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Chemical processes are used to extract the DNA from the wood.



5

A match with one of the fingerprints in the database gives the source of the wood. In the case of this ship's timbers, a potentially large area. The combination of the DNA and the annual growth rings points to the region around the port of Gdansk in Poland (not southern Sweden as was originally thought).



Larger than life

FOCUSING ON INSECTS

The coronavirus crisis has given entomologist Hans Smid more time to pursue his hobby: recording insect behaviour. On film now too, and with amazing results.



Text Roelof Kleis

On close inspection, the life cycle of the parasitic wasp *Cotesia glomerata* is a horror story. Researcher Hans Smid captured it in a film precisely two minutes long, which can be watched on his new website bugsinspace.nl. The parasitic wasp lays its eggs in the larva of a large cabbage white butterfly, where they develop into larvae and eventually penetrate the skin of the adult caterpillar to emerge into the outside world. The film has a high yuck factor. 'It's ghastly,' admits Smid. 'You don't normally see it because it takes place on a micro scale. The caterpillar gets devoured from the inside out.' But then something strange happens. The caterpillar appears to come out of this adventure unharmed. In fact, she looks after the wasp larvae as if they were her own brood. How weird is that? 'Parasitic wasps manipulate their host's behaviour,' explains Smid. 'Viruses that come with the eggs probably play a role in that. They hamper the host's immune response and change the behaviour of the caterpillar once the larvae have

hatched. In fact, the wasps turn the caterpillar into a zombie.'

Hans Smid has been doing research on the fascinating behaviour of parasitic wasps ever since he got his PhD. He focuses specifically on the learning behaviour of parasitic wasps. Some species learn fast while others are slow learners. He found an explanation for that difference through neuroethological research.

This is all quite unconventional for a career that started in the lab after Smid trained as a lab technician in the mid-1980s at the then Van Leeuwenhoek Institute in Delft. He proved to be allergic to the lab animals that were then in standard use. 'I did one week of an internship at TNO, working with rats and mice, and it affected my lungs.' What then? In Wageningen he could work with insects. 'At least they are not furry animals, so I thought I would

be able to do that. It went fine for two years, and then I started to be affected by those Colorado beetles.'

Burnout

By then his internship had already led to a permanent job as an analyst. He was even given the chance to do research himself and to get a PhD. 'It was fundamental research on the regulation of reproduction in Colorado beetles. On how it works, and which substances (sex peptides) are involved.' Smid got his PhD in 1998 in a period of major reorganizations at the university. 'More than half the chair group staff left, including my co-supervisor. I got to stay, and I got involved in the research into the learning behaviour of parasitic wasps. It was an added advantage that I wasn't allergic to them.'

Smid's career progressed smoothly until 2016, when he had a burnout from which he never fully recovered. 'I now work as a lab manager for a total of three



'I am not a typical nature photographer who will spend an hour lying on his front in the water meadows to get that one shot' Photo Erik Scholten

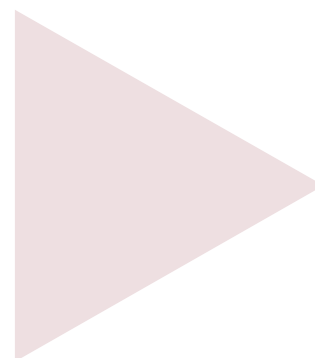
days a week. But I can't carry on with my research. I can no longer concentrate for long on academic literature, writing, or on teaching and practicals. I couldn't possibly spend the whole day on Zoom, the way people are doing now in Covid times.'

To make good use of his time, Smid moved his photo studio from the campus to his house in the centre of Wageningen. 'At least that is work I can do without overdoing things.' By studio, Smid means all the equipment he's been using for over 10 years to take the most fantastic photos of insects. Macro photos which portray the insects larger than life. 'It started in 2000 when I bought a digital camera for my microscope. It

could take macro photos too and I used it to take my first photo of a parasitic wasp. Wow! That was beautiful – and easy.'

'One thing led to another. We got another camera and then another, and it kept getting better and better. Two of my colleagues and I started the website *bugsinthepicture*.' A few years ago, though, his situation forced him to give up that website. Now, with *bugsinspace.nl*, Smid has a new home on the Internet. 'It's a working title, actually. I thought it up in five minutes. I was thinking of

'IT GOES WRONG 100 TIMES BEFORE IT WORKS ONCE'





A parasitic wasp (*Nasonia vitripennis*) on the pupa of a blowfly. The wasp is roughly 2 mm in size. Photo Hans Smid

'I WANT TO GET A PICTURE OF ANIMALS AND THEIR BEHAVIOUR IN A WAY THAT IS ETHICAL'

'THERE USED TO BE TOTALLY DIFFERENT CAMERAS FOR PHOTOGRAPHY AND FILM. THAT'S NO LONGER THE CASE'

insects in 3D, because you can look at my panorama-mode photos of the insect from all sides. I needed a catchy phrase to make those interactive shots and films accessible.' Because this is something new: Smid photographs insects from all sides and films them as well.

Complicated

The step from photographs to videos is not as big as it might seem, he says. 'There used to be totally different cameras for photography and video. That is no longer the case. I have a Panasonic that is used by professionals too. It switches easily between photos and video and there's a natural flow from one to the other. You use the same lens, and the same lighting with LED panels. You don't need flash anymore. You can photograph perfectly with LED lights.' One big difference is the depth of field. 'A lack of focus in a photo is often very obvious and I solved that using the focus-stacking technique to superimpose dozens of photos on each other. In a film, a slightly fuzzy section is not such a problem because the subject is moving. But because of that movement you do have to be refocusing continuously. You can't use the autofocus for that; it's too slow and imprecise. The

macro lenses that I use the most don't even have autofocus. So you have to do that manually. I operate my camera on a rail system. Using a touchscreen, I can move the camera to and fro very precisely. I use my other hand to do the same with the tray I've got the insect on. And I follow the result on a monitor.' That sounds complicated, and it is. 'I very often have to do it again before I get a good picture. There are a lot of failures. For example, I still haven't got a good film of a mosquito biting. Either I'm just too late, or my hand that the mosquito is on moves a bit too much, or the mosquito refuses to bite time after time. It goes wrong 100 times before it works once.'

'What I want is to get a picture of animals and their behaviour in a way that is ethical,' is how Smid describes his goal. 'I am not a typical nature photographer who will spend an hour lying on his front in the water meadows to get that one shot. I work indoors, I have a technical approach, and my main aim is to get a picture with the sharpest focus possible.' And yes, he does manipulate the photos, admits Smid. 'You are already doing that when you arrange the creatures in front of your camera in a way that will make them display the behaviour you want to get a good picture of.

But the behaviour they display is natural: this is how they go about things. And you can only manipulate an insect to a certain extent. The bug just follows its instincts.'

Not just beautiful

Smid's work has become more than a nice hobby by now. 'I provide my colleagues with a lot of material. Those interactive shots are very useful in practicals. A picture says more than a thousand words and that works on several fronts. Insects are incredibly photogenic, which is something you should make good use of in presentations, in teaching and for PR purposes. It is so nice to be able to show the behaviour you're going to talk about at the beginning of a presentation. It grabs people's attention straightaway.' But the images are not just beautiful, they also provide new information. For example, for one of his colleagues, Smid filmed the behaviour of male parasitic wasps whose sexual development was inhibited by RNAi. 'Their behaviour looked normal, and yet they were not capable of impregnating females. Only by filming at high speed and then watching the films one after the other in slow motion could you see the subtle differences in mating behaviour. You would never have seen that with the naked eye.'

Smid's work is much appreciated by his colleagues. Would he like to do more of this? 'The big problem is that it is enormously time-consuming work,' Smid responds cautiously. 'So it's very expensive if you get paid for all those hours. Plus, even photography involves a lot of computer work. I really have to watch out that I spread my energy evenly over the day. It's easy to do too much and you only notice that when it's too late. For the time being, it's a welcome change from my normal work. Especially now, in Covid times.' ■

Students bring WUR curriculum up to date

‘Why isn’t there a course on the protein transition?’

MSc student Panagiotis Vlachogiannis wondered about this question. So he and a few like-minded students kept knocking on their lecturers’ doors until someone said, ‘Yes, let’s do it.’ Text Luuk Zegers Illustration Shutterstock.com

When Panagiotis Vlachogiannis (25) came to Wageningen for his MSc in Human and Animal Physiology, he felt something was missing: a course about the protein transition. ‘I am very interested in the shift away from traditional animal protein towards alternative protein sources. WUR is a strong player in the protein transition, but while many relevant courses scratch the surface and discuss parts of it, there was no specialized course that gave a good overview of this field. As I want to have a career in

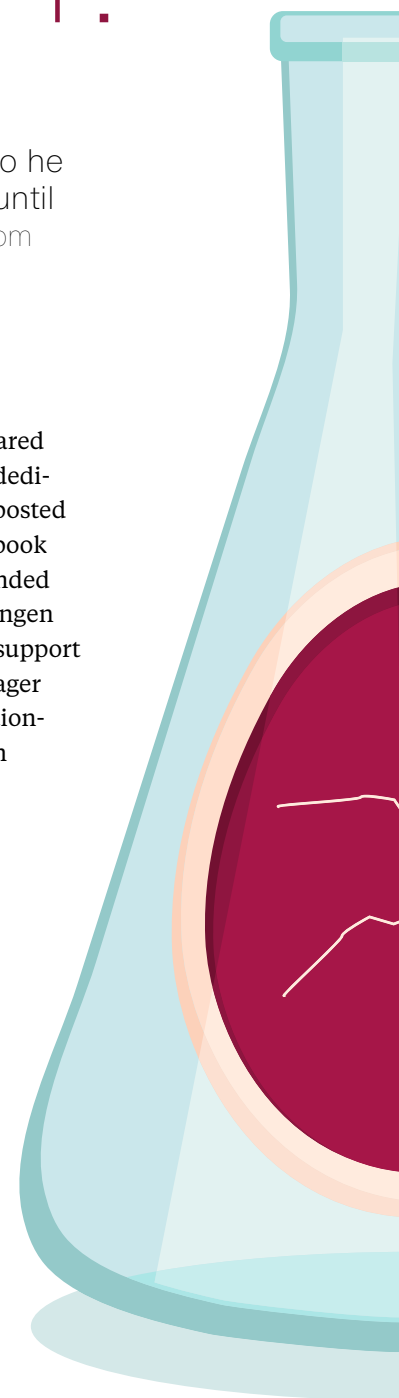
this area, I felt that was a gap that needed filling.’ Vlachogiannis started looking for people who shared his view. ‘I could not find a group or association dedicated to this subject, so in the summer of 2020 I posted a message on Wageningen Student Plaza (a Facebook group, ed.) and got responses from three like-minded students. Together we started WAPP: the Wageningen Alternative Protein Project. We did this with the support of Stacy Pyett, Proteins for Life programme manager at WUR and the Good Food Institute (an international non-profit organization working on the protein transition, ed.) There are five of us now, all from different countries and backgrounds, but with a common interest in making a positive difference to how we feed the world.’

Barbecues and tastings

Once the students had founded WAPP, they started to think about exactly what they were aiming at. Vlachogiannis: ‘Do we just want to get together to discuss the latest developments in the sector? Should we focus on fun activities, like barbecues and tastings of alternatives to meat and dairy



Panagiotis Vlachogiannis
MSc student of Human and Animal Physiology



products? We decided we have three aims. One: to help WUR to create a course on the protein transition. Two: to stimulate open access research and draw attention to alternative protein projects in Wageningen. And three: to bring people together in a fun, inclusive community of students and researchers for friendly talks, plant-based tastings, discussions and much more. 'Alternative protein refers to all animal-free protein to replace meat and dairy produce,' says Vlachogiannis. 'It should have the same or a similar nutritional value without being cruel to animals, and of course it also has to taste good. Some people working on the protein transition focus on plant-based solutions, some on fermentation processes, and I focus on cell-based or cultured meat. All these topics have a place in WAPP and all of them and more should be included in the course that we want to help create.'

Knocking on doors

So how do students develop a course? 'You don't,' says Vlachogiannis. 'We are students, not teachers. But we felt strongly about this subject so we explored the possibilities. We started to knock on our teachers' doors to tell them that there is this gap in WUR's curriculum when it comes to the protein transition and that we'd like to change that. Some teachers were interested, some were not. Then we talked to Guido Sala in the Food Science and Agrotechnology department. He said "Yeah, let's do it!" So now the course is coming, hopefully as early as next academic year.'

'Hopefully the course will be taught next academic year'

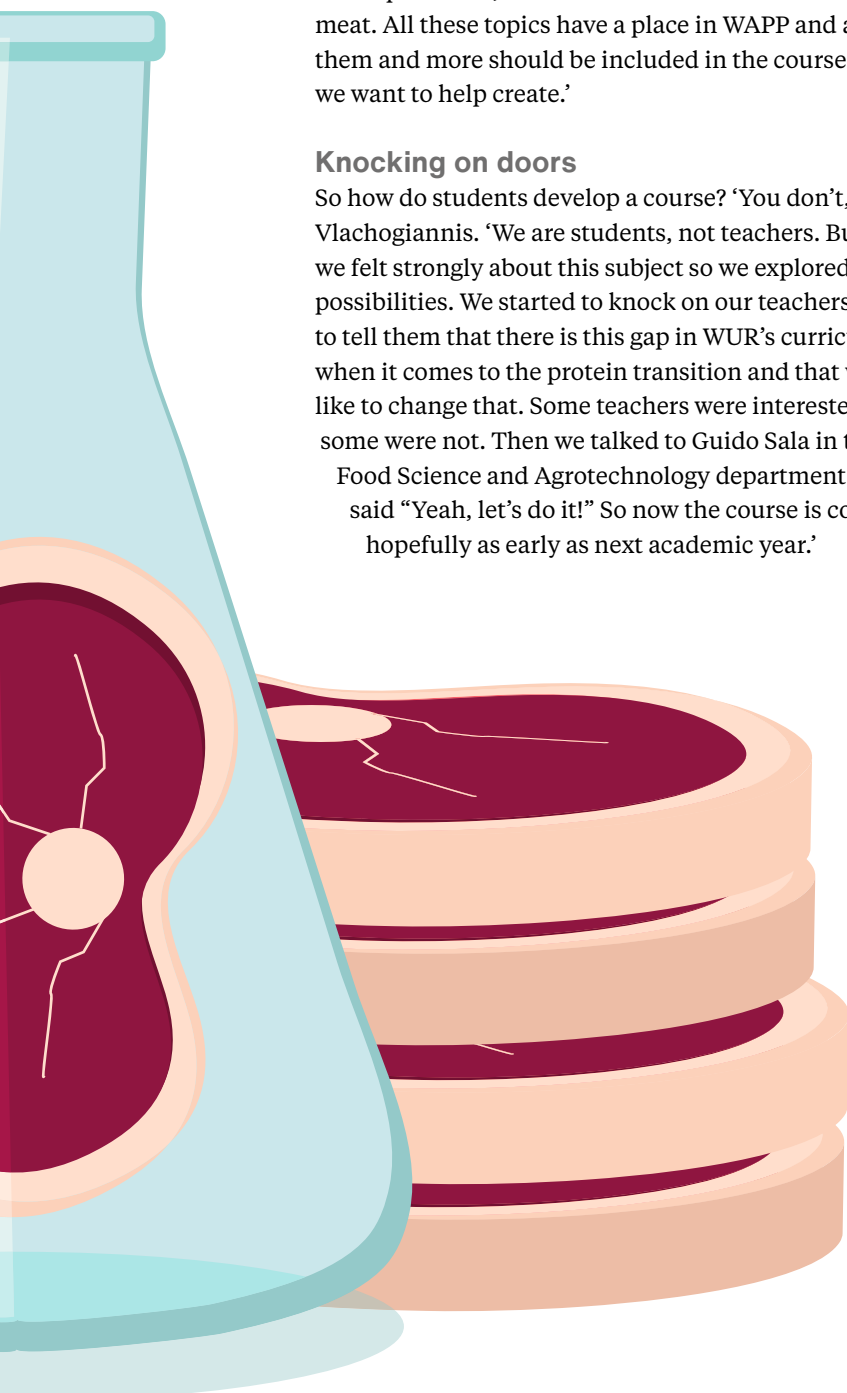
'I think it's great that students have come up with an initiative to develop a new course,' says Sala. 'Yes, we do intend to teach this course next year, but we are still in the early stages at the moment: we've got a draft framework for the course. The subject is already taught in several separate bits, actually: In Food Structuring, they look at the structuring of plant-based proteins; in Plant Sciences, they look at particular crops for the protein transition; there are courses about insects as food, and so on. To run one overarching course on the protein transition, we need several different teachers. We haven't found them all yet. But in theory we could design this course quite quickly, and if that goes well, we could teach it next year.'

Sociologists

Sala wants to keep the content of the introductory course on the protein transition broad. 'So deal with innovative technologies for producing meat and dairy substitutes, but also look at sociological aspects, for instance: which initiatives make sense? How can alternative proteins start playing a bigger role in our diet? Ideally, I would like to get sociologists or people in the Leeuwenborch who are working on innovations and transitions involved in the course.'

'We volunteer as student assistants,' says Vlachogiannis. 'Meaning that we will be there for the teachers to make their lives easier in the process of creating this course.' As Vlachogiannis is currently in the second year of his Master's programme, chances are that he will graduate before the course is taught at WUR. 'First of all, this course is not about me. We started WAPP together and the project will continue after I graduate. The primary purpose of WAPP is to provide students and researchers with a community in which the protein transition is central. Of course, it will be a bummer if I can't be in the classroom when the course is launched. Maybe I can arrange something with the teachers so that I can be present to see our project bear fruit.' ■

◀ Master's student Panagiotis Vlachogiannis took the initiative for launching a course on the protein transition: 'Some people working on the protein transition focus on plant-based solutions, some on fermentation processes, and I focus on cell-based or cultured meat.'



Making a romantic dream come true

A YEAR IN THE WILD

To strengthen their bond with nature, Forest and Nature Conservation lecturer Koen Arts and his wife Gina slept outdoors in a tepee for a year. He describes their experiment in his book *Wild Jaar* (Wild Year).



Text Roelof Kleis

ly just talking about nature. That was a major motivation for the experiment.'

Koen Arts grew up in the Brabant countryside and knew from an early age that he wanted to do 'something to do with forests and nature' when he grew up. As it turned out, he studied Forest and Nature Conservation at Wageningen, and he's been working here since 2015. But as his career progressed, his bond with nature gradually weakened. Realizing this let him to a radical remedy: a 'wild year'. Sleeping outdoors for a year and spending at least half his time outdoors too.

Wasn't your wild year primarily an attempt to go back to being that little boy who wanted to be a forester?

'Yes, I think it was. It was based on a strong romantic longing for an experience of nature, there's no denying that. And that longing gets stronger for me if I'm indoors a lot. I spend 95 per cent of my working hours at my laptop. A lot of our students are fired with enthusiasm for nature conservation and long to do something good for the world. That's how I started out too. And by now I was main-

Your definition of wildness is the uncontrollable. Was your wild year really so wild?

'In many ways it was. By sleeping out of doors you shift your boundaries. Take the cold: being cold colours your experience of nature. As soon as you're cold you can't enjoy yourself anymore. You're preoccupied with your body. If you spend a lot of time out of doors it confronts you with the limitations of your own body. The first thing you need is warmth. And that means fire.'

Did you rediscover fire?

'Yes. When we think of nature we think of biodiversity, trees and forests. But fire is part of nature too. Fire is essential. If you live outdoors, you're busy with fires a lot of the time. Collecting wood, splitting it and making your own firelighters. Fire structures your evenings. What's more, fire changes a dark cold place into a home and provides a psychological boost. It warms you up and makes you

feel safe, and you can't stop looking at it. If you have a fire you don't need Netflix.'

But surely you don't have to go into the woods to experience that wildness?

'No, you can do it in your own back garden. You'll hear an owl there at night too, oystercatchers will fly by or frogs will cross your path. That is the hopeful message of this experiment. You can do it anywhere, even in the city, by sleeping on your balcony, for instance, or opening the windows wide. Another aim of the experiment was to find wildness in

'BY NOW I WAS MAINLY JUST TALKING ABOUT NATURE'



'Comfort ends up leading to routine, laziness and dullness.' Photo Otto Kalkhoven

a country that doesn't have any wilderness. How do you go about looking for that? Which buttons do you have to press? That is exactly why we camped not just in the wild on the Veluwe plateau but also in our back garden and various interesting, hybrid places where nature and culture come together.'

So you don't really need a wilderness for a wild year. What do you need?

'You need to want to push your bound-

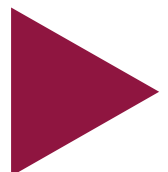
aries. You need to approach the nature around you in a slightly different way. In the Netherlands we know exactly where the nature is. We put fences around it and put up signs with all kinds of rules that apply there. That is the kind of nature where we take a walk on a Sunday. The experience of nature you get there is very much in a strait-jacket. To get a different experience, you need to find access to nature in a different way. At dusk, for example, or at night.'

New course

Students will soon be able to take a course on 'going wild' with Koen Arts. He is currently setting up a course called Anthropology of Basic Nature Skills, combining theory and practice. 'The idea is to go into the woods with students and use the experience as the basis for reflecting on the anthropological significance of fire, sleeping outdoors, and other nature-related skills. I want to link this up with transformative learning. I think that's going to become much more important in the next 10 years. That cross-fertilization between environment and learning worked very well for us. Being outside made me more creative and more productive. It would be interesting to do research on that. Are students more productive if they study outside as well? Do they get a better command of the material?'

In your book you propose abandoning the strict distinction between culture and nature. What do you mean by that?

'That distinction runs through the entire history of nature conservation. Nature versus culture sounds harmless enough but it isn't. It's a very bloody distinction, actually. The first national parks in America in the 18th century were established at the expense of the indigenous communities. Thousands of people were evicted from the parks because the idea was that nature had to be empty. We've still got that dualism.'





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As long as nature remains something abstract and romantic, it can never become part of daily life, and as a result, our bond with nature is not as strong as it could be. And that is reflected in problematic issues such as our ecological footprint. To give a specific example: stoking a wood stove is linked to an experience of nature whereas fiddling with your thermostat is not.'

Are we too addicted to comfort?

'Yes, I believe so. Comfort is extremely attractive. There are many good arguments for comfort, but it ends up leading to routine, laziness and dullness. Comfort makes your world smaller and I think you should always try to make your world bigger. Which isn't always easy. Spending the night outside in the winter is cold. But it's just like jumping into cold water: once you get used to it and you get out again, you feel great and very happy.'

Is being outdoors addictive too?

'Definitely. Gina and I still try to be

outside a lot. Not because we have to but because we want to. Now, with a newborn baby, we're in a period when it's harder to go outdoors. But that will change quickly. Children have an inborn fascination with nature. And they give it a whole new dimension as well. If my two-year-old daughter sees acorns she starts collecting them, so we collect acorns together. That makes me look at acorns in a whole new way. How you experience nature depends a lot on your age, the phase of life you're in, and how you're feeling. For a young child, a park can feel like a very wild place, while for someone else it's just a place to walk the dog.'

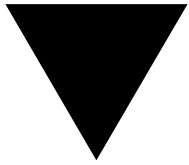
'NATURE VERSUS CULTURE SOUNDS HARMLESS ENOUGH, BUT IT ISN'T'

What is the most important lesson you have learned from your year outdoors?

'Even with a busy job and lots of obligations, in a country with 17 million people and no wilderness, you can really connect with nature. Anything is possible, even during a lockdown. Nature doesn't have to be just scenery, which you look at with your hands in your pockets. That is not satisfying. Do something. Follow a trail, pick a mushroom, or make a fire. Open a window and watch the birds fly past. What do you smell? What do you hear? That kind of sensory experience of nature is important.' ■



'Fire changes a cold, dark place into a home.' Photo Otto Kalkhoven



Key people: Berry Onderstal

They are indispensable on campus: cleaners, caretakers, caterers, gardeners, receptionists – the list is long. *Resource* looks up these key people. This time meet Berry Onderstal (34), a technician at Unifarm.

Text Milou van der Horst Photo Guy Ackermans

‘You never stop learning here because we work with the latest agricultural techniques. Since I started at Unifarm four years ago, we’ve been working with drones and for the past year with the field explorer, a machine that flies across a field scanning the height and leaf surface of every plant. If we combine the data from these two techniques, we get a 3D image of the field and every plant in it. That helps us to monitor growth well and apply pesticides precisely, for example.

‘Sometimes people get aggressive because they think you are spying’

Now most of my job consists of flying the machines, producing the images, and everything that entails. I’ve got my pilot’s licence too: air traffic rules apply to drones as well. And I’ve got a diploma that qualifies me to communicate with the air traffic control tower at Schiphol airport. I was glad of that opportunity, but it was quite tough.

It’s no good getting frustrated easily in this job, because all the technology is new. It’s not just a question of plug and play. There have been times when I wanted to throw the drone at a wall. You also need to operate very safely and be patient, because during the flight you

keep an eye on the drone as it follows its automatic route, sometimes for two hours at a time. And it helps if you are sociable because there are always two of you flying the drone. Then, if something happens to the pilot, the spotter can bring the drone back safely. The spotter interacts with spectators, as drones do attract an audience. Sometimes people get aggressive because they think you are spying. We were once filming a forest when three men suddenly ran screaming towards us, because they thought we were photographing them.

I have two passions: my vegetable garden and my work. I had a passion for plants and seeds even as a child, and yet I started out working in telecom. Now I combine technology with plants — perfect. I can use what I learn at my work in my vegetable garden. I am definitely in the right place.’





Campus ♦ companies

Mylium

Iris Houthoff, who founded Mylium, has just finished Startlife's Accelerator programme. 'I got a lot out of it,' she says. 'We now have a marketing strategy and a financial plan for the next five years.' Mylium develops textiles based on mycelium (fungal threads), with the aim of providing a sustainable vegan alternative to animal products such as leather, silk and wool.

Houthoff established Mylium in 2018 and has been based at the Business & Science Park since 2019. There she has her own laboratory for producing and processing mycelium. She worked on this part-time at first, as she was also teaching in the Bioprocess Engineering chair group at WUR, but she has now given up that job to work fulltime for Mylium from February, as well as taking on two employees.

Mylium's fungal threads are suitable for making textiles, but Houthoff is still working on

The first customer is the fashion industry, which wants to produce sustainable luxury bags made of mycelium

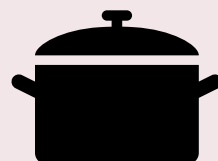
improving the product characteristics. The start-up is planning to start production in a pilot factory at the end of 2021. Its first customer is the fashion

industry, which wants to produce sustainable luxury bags made of mycelium. Discussions are taking place with investors with a view to facilitating this.

Mylium is also looking for interns for next year, particularly students who can do market research and who can work in the lab on the production process. AS

About 100 companies are housed on the campus. *Resource* introduces them to you. This time: Mylium, at the Business & Science Park.

All the flavours of the world can be found in our WUR community. Food Technology student Andronikos Ballis takes us to Greece to share his favourite comfort food.



Flavours of WUR

Pastitsio

'Pastitsio is a traditional Greek dish. Every family has a slightly different recipe, resulting in hilarious battles between grandmothers, fighting over who prepares it the best. Vegetarians can replace the meat with soya mince and mushrooms.'

- 1 The mince: in 2 tbsp olive oil, fry the onions, half the sugar, thyme, garlic and tomato paste. Sauté for 2 minutes, then add the mince and wine and let the alcohol evaporate. Add the tinned tomatoes, cinnamon, the rest of the sugar, stock cubes and bay leaves; turn down the heat and simmer for 10-20 minutes.
- 2 The béchamel sauce: melt the butter, add flour and cook for a few minutes. Now add the milk in small batches, whisking continuously until it is nice and creamy. When ready, remove from the heat and add salt, pepper, nutmeg and most of the grated Gruyère. Stir the egg yolks in last.
- 3 The pasta: precook the pasta and spread it in a casserole dish. Add 2 eggs, lightly beaten, with the thyme, parsley and crumbled feta cheese.
- 4 To assemble: preheat the oven to 180°C. Mix some of the béchamel sauce into the mince and spread the mince over the pasta. Top with the rest of the béchamel and sprinkle with grated Gruyère. Bake for 40 minutes or until the béchamel turns golden brown.

Ingredienten:

- **For the mince:** 4 tbsp olive oil; 1 tbsp granulated sugar; 2 onions and 1 garlic clove, finely chopped; fresh thyme; 2 tbsp tomato paste; 750g minced beef; 100 ml red wine; 400g tinned tomatoes; 1 tsp cinnamon; 2 beef stock cubes; 2 bay leaves; 1/2 bunch parsley;
- **For the béchamel sauce:** 100g butter; 100g flour; 1 l milk; salt; pepper; 1/2 tsp nutmeg; 100g Gruyère cheese, grated; 3 egg yolks;
- **For the pasta:** 300g bucatini pasta; 2 eggs; 200g feta cheese; 1/2 bunch parsley, finely chopped; 30 ml olive oil; finely chopped thyme



Andronikos Ballis
Food Technology student

In other news science with a wink

◆ ONLINE

All those online meetings are bad for the environment, shows a study by Purdue University. Meetings using video increase your ecological footprint the most. An hour-long video meeting costs one kilo of CO₂, 12 litres of water, and an area of land the size of an iPad mini. Without video, the footprint is 96 per cent smaller. So do we really need to see each other?

◆ LONELY

Loneliness is visible in the brain, shows a study by McGill University. Regions of the brain that are involved in imagination, memory

and future planning are bigger and more developed in lonely people. The researchers think this is because, for lack of interaction with others, lonely people are forced to use these brain regions more. Practice makes perfect, I guess.

◆ WHOPPER

The remains of a dinosaur found nearly 10 years ago in Argentina may well have belonged to the largest animal ever to walk the earth, say researchers from the Universidad Nacional del Comahue. The titanosaurus is estimated to be 36.5 metres long. That is three metres longer than

the largest living animal, the blue whale. It swims the oceans and is still going strong.

◆ WALKING PROTEIN

Ageing mice are fitter and walk further and faster if they are treated with the hormone MOTS-c, shows research at the University of Southern California. MOTS-c, a small protein, is manufactured by the mitochondria – a cell's energy factories. Not just in mice, but in people too. So there is a market. A small pot (5 mg) costs sixty dollars. Run and get it! ^{RK}

IN MEMORIAM

JOSIE ZEEVAT

It is strange and very sad for us that Josie Zeevat-van Homelen is no more. She died suddenly of a heart attack on 17 January. Josie was a secretary in the Physical Chemistry and Soft Matter chair group for many years. But she provided far more than administrative support: with her tremendous empathy, she saw better than anyone when someone was troubled by something, and would offer practical help and, more importantly, emotional support. And so, with her warm personality she made a crucial contribution to a warm and friendly atmosphere in the chair group, and she made friends for life with many people at home and

abroad. Her cheerfulness and resilience in the face of difficulties in her personal life were extraordinary and were an example for us. We shall always cherish our memories of Josie.

*Martien Cohen Stuart and
Jasper van der Gucht
Physical Chemistry and
Soft Matter*

KLAAS OOSTINDIE

Klaas Oostindie BSc, who worked at ESG, passed away on 9 January at the age of 64 after a short illness, the result of a serious disease that had only recently been detected. Over the past 45 years, Klaas worked for the Institute for Land Development and Water Management (ICW), then the DLO Winand Staring Centre, Alterra, WENR and finally Wageningen University. He started out as a computer assistant and was involved in setting up the central computer system at ICW. He enjoyed advising the researchers so much that he soon became a research assistant, working on projects in the Netherlands and abroad. In his jobs at DLO,

Alterra and WENR, he played a key part in research on preferential flow, the role of hydrophobia in soil and erosion. In his final years at the university, he enthusiastically assisted PhD students and he was involved in project websites. We will miss his knowledge, willingness to help and dry sense of humour.

*Prof. Coen J. Ritsema, on
behalf of the Soil Physics
and Land Management
chair group*

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Resource

WUR from within: straight, sharp, transparent



Resource needs you



We print contributions from readers in each issue of *Resource*. If you are an international student or member of staff, perhaps you have a nice anecdote about your experience of going Dutch (page 5). You might want to

share a great dish from your country (page 29) or become 'A Little Wiser' (page 8). Or maybe you have some tips and tricks for us. If so, please email us at resource@wur.nl

We need you!

Colophon

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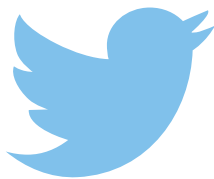
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You can share your science stories via social media, but how should you deal with the many inane and sometimes downright disappointing comments? Responding to everything is pointless and costs a lot of time. So should you just ignore them?

Herbert Prins, professor of Resource Ecology



Tweet what you are sure of

'As a nitrogen specialist, I struggle with this question too. Scientists speak with authority, so your words weigh more heavily than those of activists or random members of the public. But if you take an activist stance, that affects your authority as a scientist and you attract more ridiculous reactions. So my strategy is only to post on subjects I really know a lot about. I also tweet as little as possible in Dutch and I always stay polite. And the anonymous or rude responses? I ignore them.'

Jan Willem van Groenigen, professor of Soil Biology

Support

'Social media can sometimes seem like a hornets' nest. I'm active on Twitter myself, and I find irrelevant debates very annoying, especially when your opinion is unconventional. I certainly don't consider it necessary to respond to personal attacks or ridiculous reactions. Instead, support your arguments scientifically and clearly in your posts. That way you'll take the wind out of the sails of your opponents and you'll provide a nice platform for starting rational debates.'

Simon Goddek, postdoc in the Mathematical and Statistical Methods Group

Mental health

'It's impossible to reply to every ridiculous post on social media, although it's certainly good and worthwhile to engage in discussion sometimes. But don't forget that people will go further and behave worse online than they would in real life. So just stop those kinds of online discussions if they are affecting your mental health or making you lose confidence about your work.'

Jerry Gumbs, Environmental Sciences student

Avoid subgroups

'On Twitter you certainly do get some hostile reactions. But I still sometimes enter into discussion with such people just to get out of my own 'echo chamber'. I think it's important to take part in the public debate and to publicize our scientific findings. If you don't do that you'll soon be stuck in a subgroup on social media where everyone agrees with each other.'

Judith Westerink, senior researcher in Landscape Governance

NEXT WURRY

My housemate bought a hamster because life under lockdown is so boring, but he soon lost interest in the animal. Now he has graduated he's got a busy job and he hardly takes any notice of the little creature, which we think is very sad. We'd like to help him look after it, but he doesn't think that's necessary. What should we do?

C's housemates (names known to the editors)

If you have advice or tips for this WURrier, or if you need some help yourself, email your tips or question (max. 100 words) by 9 February to resource@wur.nl with subject 'noWURries'.