



## PREFACE



Dear reader,

It is an honour to welcome you to the first Lifeline of this academic year. After months of salt air and driving shotgun with my hair undone, it's time to go back to the lecture halls and hide the little black dress in the closet. Put on your favourite cardigan and cosy up under starlight while you watch autumn leaves falling down like pieces into place. Fall has it all, hats and scarves and knee socks and wearing tights for the first time in months... you name it, 'tis the damn season to capture in screaming colour and write about! Let me introduce you to FALL! The perfect read during grey skies and full on rainstorms, filled with fallen civilizations and a meteor strike. Accompanied by a busted myth, an iGEM interview, and murder, all covered in beautiful colours, such as maroon, hunter green, and mustard yellow. Long story short, prepare to have the best day reading FALL.



Dear reader,

This year, it is my honour to write the preface of the first Lifeline of this year. I would like to start by welcoming you all back after the summer break. I hope you are all just as excited for this year as I am. This year, our focus is on "Fall", not just as a season but as a symbol of change and renewal. In these pages, you'll find an assortment of stories, art, and insights that capture the spirit of this season.

As you read, we hope you'll be inspired and discover something new. Just like fall brings warmth to cooler days, our goal is to offer you an enriching reading experience. Thank you for being a part of this journey. We present to you the fall edition of the Lifeline, designed to explore the charm of this season and to bring joy and reflection to your day.

Warm regards,

Sieuwert Molema

Chairman of GLV Idun 2023-2024

Lots of love,

Cecile Bruil

Lifeline editor in chief 2023-2024

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GLV Idun

### Lifeline presents

**SCIENCE NEWS** 



## **Breakthrough: Scalable Spider Silk** production with Silkworms

By Jelle de Jong

twice the amount of resources each year than that Earth can deliver in renewables. For a successful transition away from a hydrocarbonbased economy, the products derived from fossil fuels need to be replaced by renewable alternatives. What makes the transition so difficult is our ubiquitous use of plastic; it is everywhere and can be tailormade for almost any purpose.

to be developed that can compete with the scale and quality of current methods. A seemingly impossible task. A task that can be made more bearable with

depressing thought; we the use of genetic modification. burn through almost Using modified silkworms for the mass production of spider silk is a recent example of this.

Previous production methods for spider silk were expensive and struggled with maintaining its quality; spiders apply a layer of glycoprotein on the silk that enables it to withstand humidity and light exposure. Amazingly, when silkworms produce spider silk, a similar protective coating is applied. With this high-quality and scalable silkworm spider Novel production methods need silk, synthetic fibers like nylon and Kevlar are one step closer to being replaced. A step on the road to a world less reliant on non-renewables.





## From rash decisions to health provisions

#### **By Cecile Bruil**

the older students shout to the freshmen who are secretly smoking their first cigarette in the bike shed. A small choice that, without them knowing, leaves a mark on their future. Everyone knows that smoking is bad, but it turns out that the age at which you start smoking can influence the lung health of your future children. Scientists examined the blood of over 800 father-child pairs and took questionnaires about their smoking habits. It turns out that the risk of asthma and obesity in offspring is significantly increased when boys start smoking before the age of 15.

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ne won't hurt - is what This is because smoking leads to an increase in methylation on the offspring's DNA. These groups can suppress the normal DNA function and lead to diseases like asthma and obesity. Children of fathers who started smoking before their 15th birthday have methylation on 19 different sites on their DNA. In contrast, children of fathers who started smoking later only have methylation on 2 sites. This major difference is because the germ cells of teenage boys are not fully developed yet. Therefore smoking not only affects their own lungs but also those of their offspring.

Lifeline

### The Human Brain **Project** has come to an end



**By Gintare Petraityte** 

took a decade, 500 scientists and around €600 L million worth of research to complete the largest human brain modeling project ever. Although the original goal of simulating the entire human brain was not achieved, the project still overcame several essential milestones Here are neuroscience. in

some of the greatest hits! By combining 3D maps of some 200 cerebral-cortex and deeper brain structures, the researchers have created a human brain atlas showing the multi-level organization of the brain. It's like Google Maps, but for the brain. This helped to identify six previously unknown brain regions in the prefrontal cortex

that contribute to memory, language, attention and music processing. Moreover, a new algorithm has been developed to create full-scale scaffold models of brain regions from microscopic images. These research advances have been used to improve the treatment of epilepsy by making it easier to identify the origin of seizures

and increase the success rate of surgery. The findings have also led to improvements in the treatment of Parkinson's disease and to the development of brain implants to treat blindness. Although the HBP has ended, it started off many smaller-scale spin-off research projects to further research in this area.



The learning buffer, the protection against Alzheimer's

**By Michelle Berendsen** 

Ling many aspects of a patient's life. There still is much to learn about Alzheimer's, and with this mutation are known it is a highly active research to develop dementia around the topic. Here are some of the age of 49. The researchers tested latest updates. A new study by researchers from Mass General Brigham suggests that when it comes to the risk of Alzheimer's disease, even so more years of education, genetically determined forms was associated with preserved are but one piece of the puzzle. Researchers discovered that an educational buffer and learning risk. slows genetic Alzheimer's risk. The researchers investigated the influence of genetics and educational attainment on cognitive decline by studying

lzheimer's is a well- data of 675 people with a known disease affect- mutation PSEN1E280A, which predisposes early onset Alzheimer's disease. Patients patients' cognitive function and educational attainment with this mutation. They found that higher educational attainment, cognitive ability, particularly for those at the highest genetic The results suggest educational attainment that may be a critical mechanism for reserve cognition in familial Alzheimer's disease.

GLV Idun

## HAPPY PUMPKIN SEASON Y'ALL!



Days are getting short, it's raining almost every day, and academic life is already draining all your energy. Welcome to the the Dutch fall the Dutch fall

But fall is so much more than bad weather and SAD: it's the time to cozy up with a cup of tea, a blanket, and a good book while listening to the sound of rain outside. And the it's the best season because...... It's pumpkin season!!!!!

#### Pumpkin gnocchi with gorgonzola cheese (or vegan cheese)

#### Ingredients:

- 600 g of pumpkin puree or about 1/3 of a medium sized pumpkin
- 400 g of flour
- A pinch of nutmeg
- A pinch of salt
- Gorgonzola cheese (the more the better)
- In alternative you can use (vegan) butter
- and some bay leaves
- Some walnuts (if you wanna be fancy)





If you buy an actual pumpkin, start by cutting it in half (be careful, pumpkins are very hard) and remove the seeds with a spoon. At this point, you can cook it as you prefer.

The easiest way is to cut the pumpkin in slices and bake them in the oven at 220 degrees for about 45 min up to an hour (depending how well your oven works). You can stick a fork in the pulp to check that it is nice and soft. Let it cool down.

Remove the skin and smash the pulp with a fork (or blender). Add the flour, salt and nutmeg and some water if needed. Mix everything and start to knead the dough.

If you wanna do it the Italian way, divide the dough and roll each part with your hands to create a long snake and cut it in pieces (the longer the snake, the more but smaller the gnocchi). If you wanna do it quickly, just cut the dough with scissors (\*Italian grandma disapproving face\*).

At this point, boil some water (or broth if you wanna gain extra points) and cook the gnocchi. As my Italian grandma taught me, gnocchi are ready when they float to the surface. So, as soon as they come up, take your gnocchi and put them in a pan where you previously melted the gorgonzola and/or the butter with laurel. Stir the gnocchi so that they take up the condiment and add the walnuts.

Serve warm and....



Fur facts about pumpkirs

- There are 45 different varieties of pumpkins
- The heaviest pumpkin was heavier than
  **1100 kilos!**
- The name pumpkin first appeared in the fairy tale Cinderella. Before that, they were called *pompions*.
- Each pumpkin has about **500 seeds**
- Pumpkins are 100% edible, so don't waste anything!

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### LEAVES FALL, SHORTER DAYS, AND BIGGER BRAINS?

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#### DO THE SEASONS CHANGE OUR BRAINS?

Fall is around the corner!! The air is getting chillier, the leaves are crisper, and cozy sweaters will come out of the closet. Fall will not only influence our behaviour but also our brains. Scientists have long believed the brain is vulnerable to seasonal shifts, such as frequent headaches in Fall and spring, mental health decline during the winter, and our cognition, which also ebbs and flows throughout the year.

Research suggests that specific neuroplasticity genes will be affected by seasonal changes and mediate our ability to think and learn. One study found that older adults with and without dementia had better cognition in late summer and early fall than in the winter and spring. They tested around 3400 older adults in the US, Canada and France. Indeed, significant changes between season and cognitive function have been shown, especially in the early Fall. Also, this study showed that protein levels linked to Alzheimer's disease vary between the seasons, suggesting that their cognitive functions would be regained for these patients in the Fall. All these mental changes are realigned in multiple parts of the season, such as temperature changes, day length, sleeping habits, diet, and hormones. One of the most common

phenomena known is the "October sleep slump", resulting from sleep changes in contrast to the weather and environmental changes. Tips to overcome the slump are consistent bedtimes, enough sunlight during the morning and enough vitamin affects mood D. which changes, depression, and fatique.

So, how do the seasons affect the brain size? Several brain regions become smaller during the summer and grow during the winter. These areas are called subcortical structures, which control complex functions like learning, motivation, decisionmaking, and emotional and sensory processing. Nevertheless, one part of the brain does the complete opposite. It will grow during the summer and become smaller during the winter: the cerebellum. The cerebellum coordinates movement complexity as well as fluidity. So, seasonal brain resizing can have functional consequences, explaining reduced cognition in the winter. Nevertheless, if size were everything, big-brained animals, such as elephants, would be more intelligent than humans. Therefore, the brain structure and how the cells are arranged and connected are more valuable.

If we look at our cognition function, we require different attention for different tasks. The brain responses are generally the highest in the summer and lowest in the winter. Tasks related to working memory result in brain responses, which are the highest in autumn and lowest in spring. However, the

MICHELLE BERENDSEN ability of participants to perform the tasks remained stable throughout the seasons. These performers suggest that brain activity varies between seasons, and the brain will adapt towards different environmental cues, but this does not affect the ability to perform tasks. The brain's neuroplasticity is one



of its unique features; therefore, it can form new connections

and pathways, adjust them, and remember them for optimal functioning. Unfortunately, the seasons may not influence our

One possible explanation of the seasonal change is the blood flow throughout the brain, controlled by atmospheric pressure. The pressure is typically lower in summer and higher in winter. These pressure changes will affect oxygen availability in the air, which results in the body adapting and adjusting blood flow into the brain by changing the size of the brain. This still does not explain why the cerebellum does the complete opposite. Besides that, brain regions behave almost independently of each other. Some shrink, others grow, and some parts do not change. There are so many questions on the seasonal effects on the brain. One thing that's for sure is that seasons come and go. Acknowledging the change and being mentally prepared to tackle it positively can make a big difference in handling several situations arising from seasonality. The fall will probably bring increased anxiety levels and a feeling of being out of control. So, practising gratitude and being present can bring you joy in any season, especially fall! When fall comes, the holidays are around the corner. That is the beauty of these seasons!



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## A FALLEN CIVILIZATION





ALESSIA

PALAZZO

What did Hancock do wrong?

Archeologists state Hancock "misinterpreted evidence to support his theory" and condemn him for spreading false stories. I personally cannot say whether the evidence Hancock has found is valid or not, however, there is plenty of other evidence that contradicts his theory. What I can say is that his method and attitude do not conform with the scientific method and integrity.

Archeology, like any other academic discipline, is based on research, evidence, analysis and peer-reviewing. The author of the series fails to provide any alternative hypothesis to his, but instead he openly attacks academia for having hidden "true evidence" and lied to everyone (also, why would they?). For these reasons, his ideas may be considered a conspiracy theory and his series pseudo-archaeological.



His attitude towards archeologists is not the only concerning aspect about the series. The ideas he proposed are thought to promote racism, white-supremacy and extremism. Indeed, he is basically proposing that advanced white people taught indigenous naive humans how to be civilized, on the assumption that they could not have developed otherwise. This is disrespectful for Indigenous people and their ancestors.

In addition, if we google the "experts" that Hancock interviewed, they are all supporters of his ideas and are believed to contribute to the field of pseudoarchaeology. The only two real archeologists present in the series have claimed that their interviews were manipulated and presented without context to support his ideas. As you may deduct, the series is very biased towards his perspective and this is not how science works.

Despite the existence of a lost fallen civilization may sound appealing, the truth is that there are still a lot of mysteries regarding human evolution and civilization. Therefore, we must proceed with caution. I believe throwing around unsupported theories and insulting academia is not the right way to go... But hey, everyone has the right to tell their story. With this article, I hope you realized the need to be critical about online information, even when it comes from so-called *documentaries*.

**Disclaimer:** this article covers the topic of conspiracy theories and pseudoscience which can both be harmful and misleading. With this, the author does not intend to reinforce the spread of conspiracy theories, but to inform and teach readers to not trust everything they read or watch online. Please read with caution.

Imagine: you are back home from a long day at uni, you are tired and just want to unwind watching a nice series. You log in into Netflix and find a *"documentary"* called Ancient Apocalypse. As a passionate scientist, you may not like history, but something sparks your interest and you decide to watch it. It keeps you entertained and, episode after episode, you finish the series believing that Atlantis was real and science has been lying to us.

Ancient Apocalypse is a series led by Graham Hancock about the early history of human civilization. According to Hancock's theory, an ancient advanced civilization existed during the last Ice Age (around 10,000 years ago) when humans were thought to be only hunters and gathers. In each episode, he visits an ancient monument explaining how archeologists are covering up the *"true"* date of the site construction. But, if such a civilization really existed, where did everyone go?

Hancock states that this advanced civilization (along with most of the evidence of its existence of course) was completely destroyed by a massive flood caused by a meteorite collision in North America (and by massive I mean cataclysmic). However, some people survived the flood (not really clear how) and decided to make it their purpose in life to travel the world and teach primitive humans astronomy, engineering, politics, etc. Basically, they taught humans to be civilized. Indeed, most cultures have stories about a massive flood and a superhero that saves humanity or teaches them the way to civilization.

The series has sparked some concerns among archeologists because it presents unproven/false theories and devalues archeology as a discipline, questioning the credibility of academics and promoting mistrust in science. As a consequence, the Society for American Archeology felt the need



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## **M<sup>HI</sup>MYTHBUSTERS**

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### CONSUMING MILK AND DAIRY PRODUCTS INCREASES MUCUS PRODUCTION

They say knowledge is power, but what if this knowledge is total nonsense? When you fall on your tailbone, you won't get blind and when you get a jellyfish sting, please don't pee on it. You will be surprised how many biological misconceptions are rooted in your mind and that of others. In our rubric 'Marit's Mythbusters', I will debunk common myths that many of you believe to be true.

Sitting on your iron stallion, you curse at the wind. With only five minutes left before your first exam, you manoeuvre quickly around all the slippery wet leaves and broken branches. Just in time, you enter Aletta. Immediately, the sniffing and coughing sounds welcome you. Yep, fall definitely has begun.

A week later, it is you who does the coughing, accompanied by litres of mucus inside your nose, and a slight headache. Remembering the words of your grandma, you swap your usual breakfast yoghurt for a dry 'hagelslag' sandwich. After all, dairy consumption can only increase the humongous amount of snot inside your head, right?



Well, no. At least, there is no scientific evidence that supports the theory that dairy products increase the amount of mucus or phlegm in respiratory systems. Still, this myth has been around for centuries, possibly originating from the 12th century, when philosopher Moses Maimonides wrote that dairy causes 'a stuffing in the head'. Moreover, the influential 'Dr. Spock's Baby and Child Care' book, published in the 1940s, also contributed to the doubtful link between mucus production and milk. Here, they state that dairy products can 'cause discomfort with upper respiratory infections'.

Given the well-rooted origin of the myth, it is persistent. Studies from a decade ago showed that around two-thirds of the participants were convinced that drinking milk increased their mucus production. People that consume milk or a dairy product report a sticky, clogged, thick feeling in their throat afterwards. But what about when you've caught a cold? A study in 1990 deliberately got volunteers infected with the common cold virus. Afterwards, the

researchers gave the participants milk. The participants had to collect and weigh their mucus and answer some basic questions. How did their throat feel after drinking the milk? Did it feel more clogged?



Interestingly, the participants that believed in the myth that dairy increases the amount of phlegm, reported more congestion than non-believers. In fact, all the participants, no matter their belief or (lack of) infection, produced the same amount of mucus. Thus, drinking milk did not influence the amount of mucus secreted.

While there is no indisputable evidence that milk increases phlegm secretion, drinking milk when having the common cold may still be uncomfortable for some. After all, anecdotal evidence that dairy products make the throat feel thick and sticky still exists. This might be due to the composition of milk.

Milk is an emulsion, which means that it is a mix of hydrophobic and hydrophilic liquids. The current hypothesis is that saliva interacts with the emulsive properties of the milk, creating a so-called flocculation.

This flocculation alters the viscosity, possibly explaining the thick feeling a lot of people experience in their throat after consuming the holy cow juice. And of course, already having a stuffy nose could make an increased viscosity in your mouth more noticeable, aka more uncomfortable.

Altogether, you can safely eat your breakfast yoghurt or drink your daily glass of milk when you catch a cold. However, despite milk not increasing mucus production, science also

acknowledges that it might be a bit uncomfortable to drink litres of milk while a virus has penetrated your cells. See what works for you and good luck beating those fall influenzas!



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## **BYE-O-FILM: A BIOSENSOR TO DETECT AND TREAT**

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### **'SAY BYE TO BIOFILMS'**

What happens if you leave 14 students alone in a lab? iGEM Groningen team 2023 You defeat bacterial films on implants. It sounds like This year, iGEM Groningen focuses on the very relevant the start of a bad joke, but for roughly eight months topic of detecting and treating biofilms. 'After surgery, straight, RUG students from different disciplines, a big but overlooked, problem is varying from Design to Physics, are working their butt the formation of biofilms off to do just that. Or at least, get as far as possible. of

This year's team kindly welcomed me into their own office and lab, where they are working on their interesting project, the 'bye-o-film'. Emphasis on THEIR, as the designated iGEM team starts from scratch in designing and performing the project every year. Once into their lab, the acoustic versions of Taylor Swift's music are it music to my ears. In the corner, not one, but two fridges are standing, fully covered in colourful sticky notes. The team laughs. 'There has been a lot of panic texting and calling about where a certain protocol is,' Thomas explains. Pipettes, tubes with green and pink liquids, a microwave that works overtime: every single thing in the lab reflects the hard efforts of the past few months.



implants.<sup>1</sup> says Ingrid, involved in this year's team. 'Biofilm veru sticky, is prevents which antibiotics from getting rid of successfully', she continues. Currently, multiple surgeries are necessary to disturb the biofilm, in order for antibiotics to break it down.

However, this extension of the medical intervention is costly and can induce other infections. The chemistry student knows how hard getting surgery can be. I was lucky to heal fast, but I can imagine that it takes a toll on the patient's mental health if this is not the case', Ingrid says. And that's how the project bye-o-film was born.

#### **Detecting biofilm**

Most biologists are familiar with biofilms, for example, the plaques on their teeth. They also probably know how tricky they can be to treat. A biofilm is a close network of numerous bacteria that communicate with each other through quorum sensing. Luckily, we can also catch these signals, when using the correct device. That device is nothing less than an E. coli-based biosensor. This biosensor has a genetic component that senses these bacterial communication signals and in turn, induces a diagnostic and a treatment process. For the diagnostic process, the team decided to use light. A red light is good news: this tells you that the biosensor works, but there is no biofilm threat. A green light is when you should be cautious: that means that a

#### WHAT IS IGEM?

iGEM is a yearly competition organised by the International Genetically Engineered Machine Foundation, where all high schools and universities all over the world can participate by forming a team. These teams will come up with a creative genetic engineering project on one of the following categories: diagnostics, therapeutics, climate crisis, environment, conservation, food & nutrition, bio-manufacturing, industrial scale-up, energy, foundational advance, software & AI,

and high school.



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MARIT BONNE

biofilm is invading your implant. The treatment phase is based on phage therapy. 'This was a hot topic in the eighties, especially in Eastern Europe,' Ingrid says. 'It has been kind of left out because there were so many antibiotics widely available.' But these antibiotics are starting to lose track: people are increasingly developing antibiotic resistance and the drugs are causing big environmental problems, the 2023 iGEM team emphasises. Therefore, phage therapy offers a good alternative.

#### To phage or not to phage

Phages are basically viruses that infect bacteria. 'The nice thing about them is that they don't mutate as fast as bacteria mutate to develop antibacterial resistance,' Ingrid says. Currently, the team is working in the lab trying to see if the phages actually manage to kill the bacteria and aid in diagnostics. Inserting the phage doesn't kill the bacteria itself, but eventually cuts off bacteria from the biofilm. That way, the bacteria come loose and your immune system can react to it again, Thomas notes.

#### iGEM's dreams and reality

Lastly, the team would also like to have a software developed that would be able to transform the biosensor data into something that you would get on your phone and see the state of your infection. 'During the iGEM project, we have limited time and resources so we're not going to have

a functional product, it's more a proof of concept,' Mirela says. When I say project, I'm saying a PROJECT. iGEM is more than answering a research question. Everything, from acquisition, to web design, to lab work, needs to be done by the students working there. Of course, they get a little guidance, but, as Mirela puts



it nicely: 'You get thrown into the deep, but also learn how to swim really quickly.' She continues to add: 'You get so much confidence in your own lab skills.' Thomas and Ingrid agree with her. 'You are free to do what you are interested in' Ingrid adds. Thomas also joined iGEM because he wanted to focus more on the financial aspect of the project. 'The laboratories themselves are quite expensive and you need to manage that as well.'

The rest of the roles were distributed very organically, the team agrees. 'Although Jelle is our Lab king,' they laugh in sync. Jelle maps out what needs to be done in the lab, while the rest of the team carries out the tasks. 'Teamwork in courses is nothing compared to iGEM. Here, you really learn how to work together,' Mirela says.

For now, the team will continue to work on the project. In November, they will go to Paris to present their project and compete with the other iGEM teams around the globe. Hopefully, they will win a nice prize, but even when they won't, the skills and memories created during iGEM are worth gold.

#### IGEM IS LOOKING FOR YOU!!

If the experiences of the current iGEM team have sparked your interest, I have good news for you! Around February 2024, a brand new iGEM team will take over and start their own research project from scratch. Make sure to hit them up around that time and fill eight months with fun, science, teamwork, and more. For Biomolecular Master students: you can even fill some ECTS with the iGEM project! For more info, check out their LinkedIn at

linkedin.com/company/bye-o-film/

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## **DISCOVERIES OF THE DEAD SEA**



the region is not void of water. Thanks to the many springs and aquifers, a cluster of more than hundred settlements thrived in the Jordan Valley, just north of the Dead Sea. Back in the Middle Bronze Age, the largest and most prosperous city was called 'Tall el-Hammam'. Over the course of three thousand years, Tall el-Hammam had grown to become the bustling center of a flourishing city-state. Another smaller, but more well known settlement in this region is Tell es-Sultan; the city of Jericho. Like Jericho, Tall el-Hammam and all other settlements in proximity were utterly destroyed. The destruction of this region must have had a huge impact on the peoples of the Bronze Age levant. While most cities were wiped off the map, some, like Jericho, have been resettled. What happened has long remained a mystery, but a thorough analysis of recently uncovered evidence suggests a most spectacular cause. Around 1650 BCE, a massive airburst turned the fertile ground to ash and reduced the cities to rubble. Traces of heat-exposure within the rubble indicate temperatures must have exceeded 2000 °C at the time of the city's destruction. Alongside the destruction, the area was covered in salt, inhibiting agriculture for hundreds of years. The event could well be the foundation of the biblical storu that describes the destruction of Sodom and Gomorrah, Genesis 18 and 19.

"Then the Lord rained on Sodom and Gomorrah sulfur and fire from the Lord out of heaven; and he overthrew those cities, and all the Plain, and all the inhabitants of the cities, and what grew on the ground." (Genesis 19:25)



One of the biggest and well documented airbursts is the Tunguska event. Since Tunguska is not that recent (1908), look up a video of the smaller Chelyabinsk meteor (2013), and get a feel

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Even though the salty Dead Sea is surrounded by arid terrain, for what Tunguska must have been like. A sudden detonation the region is not void of water. Thanks to the many springs and aquifers, a cluster of more than hundred settlements thrived in the Jordan Valley, just north of the Dead Sea. Back in the Middle of an earthquake of 5.0 on the Richter Scale. Even though it



happened above the remote East Siberia, the skies were set alight to such an extent that, at midnight, pictures could be taken as far as Scotland and Sweden. Crazy right? The airburst event that happened above Tall el-Hammam is estimated to have been stronger than Tunguska, where it flattened the four meter thick walls, ramparts and storehouses, and boiled bricks.

As a biologist, when I read about stories like this, I can't help but think about all the amazing discoveries that are yet to be made. The smallest traces can point to massive events. With genome analysis, the floodgates of genetic research opened. This allowed for a better way to classify life. More than thirty years ago research into organisms, then classified as halobacteria, reshaped the tree of life. These halobacteria are now known as haloarchaea, and are placed inside the newly added domain of Archaea, alongside Bacteria and Eukarya. Archaea are now seen as the ancestors of eukaryotes, and connect us to the root of all life (I highly recommend you to take a look at the tree of life at onezoom.org). With research into Archaea, many mysteries regarding our origin could be solved. The survival methods of current day extremophilic Archaea shine light on how our ancestors survived during apocalyptic events, such as the snowball earth, when kilometers of ice sheathed our planet, or the opposite, when meteors struck and the oceans boiled. Even when everything seems doomed and dead, there is probably something living on, something we might not even notice. The Archaea, like the halophiles in the dead sea, will probably outlive any civilization, climate change, and meteorite impacts, and, who knows, might even await us on Mars.

**ARE YOU A STUDENT? ARE YOU STRUGGLING?** LIFELINE IS HERE TO SAVE THE DAY AND **MAKE YOUR LIFE JUST** A LITTLE BIT EASIER. WE COLLECTED A BUNCH OF TIPS. TRICKS, GADGETS AND HACKS TO HELP WITH OUR CHAOTIC STUDENT LIVES

If you have any legal issues (regarding your housing situation for example) the GSB is there to help you out! The 'Groninger Studenten Bond' is there to help with any legal issues. Visit their website for some tips

and to get in touch with them.

Ever travelled for hours in an NS train, trying to distract yourself from obnoxious travellers by looking at your phone the entire time, just to figure out

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you have 7% battery left?? Next time this happens, move yourself to the first-class area, as there are charge portals over there. (Just ask the conductor kindly to avoid a fight/fine).

If you go on a Useful Excel trip to Paris/ hack: you can London using have a split Eurostar trains, screen if you you collect the multiple tabs. points. Eurostar That way you points, which in the same file can be shared while working on with friends different tabs. and family. Just google the When you have steps to get this, enough points it's too difficult free train ticket! single letter ;)

make sure have data on will give you can still work you can get a to explain in a



ple who travel with only hand luggage, we have a hack. On cheap flights, you can bring an airplane pillow, but instead of pillow stuffing, stuff it with clothes. That way you can travel with more luggage without paying for an extra carry-on

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For the peo-

In order to release some stress, a good massage can do magic. But we are all cheap AF. Therefore, when we learned you can roll up a towel, put it around your head when lying on your belly, we all thought it was genius. No need to buy an expensive pillow, and no need to squish your nose.

GLV Idun

species they are, we have the site for you: go to the Flora Europa site. They have a checklist where you fill in what the mushroom looks like, and they tell you the name! Most Lifeliners apparently live under a rock as there has been an official brightspace app the entire

If you come across some

beautiful mushrooms this

fall and wonder what

time. This app is called Pulse and allows you to access brightspace easier than through the mobile site.

During exam weeks the UB is flooded with stressed-out students truing to catch up on 5 weeks worth of lectures. If you don't want to be in the UB at this time of year, but do want to study in a designated area, try the medical library. There is usually more space. as medicine students don't have exam weeks and not too many people know about this space (yet).

A vegan treat: Meringue from chickpeas! The liquid left in a tin of chickpeas is called aquafaba and can be whipped up with sugar to create a vegan meringue. Just put it in the oven for a couple of hours to create some simple 2-ingredient vegan treats. Don't worry! They really don't taste like chickpeas.

We have all had our grandma moment, listening to a voice memo holding the speaker horizontally next to your ear and letting everybody else hear the memo. Those days should soon be over. When playing a voice memo, simply bring the phone to your ear as if you are calling someone. The sound will then automatically switch to calling mode and only you can hear what is said in the voice note. You can thank us later ;)

Word, Excel and PowerPoint are essentials for every student. And there is no need to pay full price for them! Via Surfspot you can get an amazing deal on Microsoft Office programs using your student account. And if you have a P-number, you can get the whole Adobe package for just 20 euros.

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To entertain yourself we also have a nice little tip. That is to check out 'studentenkrant.org' and go to their ranking of board pictures. They collect all board pictures of Groningen, from sport to study associations, they rank them all, and provide the funniest description about their quality.

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## **MIGRATION PATTERNS OF BIRDS**



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As winter is approaching faster than we would like, and we are getting ready to snuggle under warm blankets and drink Pumpkin Spice Lattes, it is time for certain animals to look for warm places as well. During these autumn months, birds start to migrate south in special migration patterns, depending on the hemisphere they are in. In the Northern Hemisphere, it starts as early as the end of July until early December, that's when the common swift is setting off to Africa. They fly alone and generally at night. Species that take off later in autumn mostly fly to Spain, Algeria, and Morocco and they fly during the day in flocks. In the Southern Hemisphere, migration is usually from mid-March until early June. But how do birds know where they need to go and when?

#### Ready, set, go!

There are several factors that determine when birds start to migrate. A few of these factors are listed below.

- Light: The amount of light and the angle of the sun on a daily basis are indicators of seasonal change. The days will become shorter as fall begins and the light angles become shallower.
- Temperature and climate: In the fall, the temperature will go down and in some climates, the first rainfall determines the start of migration.
- Food: Staying somewhere for the summer means of course that food is going to run out at a certain point. This is another sign that the birds use to determine their take-off. This also means that if food sources run out earlier than So, now that you know what signs the birds use to migrate, what normal, birds might migrate earlier as well.
- Offspring: Birds will wait for their offspring to mature before they start to migrate. Late breeders will therefore also start migrating later.
- Location: Birds that are further up North from the equator will start to migrate earlier than birds closer to the equator.





signs can you pay attention to when observing migrating birds in your area?

#### Signs of migration

- Fall festivals: Some towns hold specific birding festivals that are often planned around peak migration periods where the greatest variety of species will be seen.
- Hunting season: If your country has bird hunting games, this is another great way to spot migration. Local hunting seasons often focus on ducks, geese, quail, and doves.
- Backuard species: Keeping track of the species in your backyard might help you figure out their seasonal migration habits. You can use a journal to write down when you have last seen certain species and when they appeared in your garden again.
- Flocks: Many migratory birds will travel in flocks that will begin to form right before their journey. So if you see a sudden increase of flocks, they might soon leave your area.
- Plumage: When birds are in their breeding season, many male birds will appear more bright and attractive for the female birds. However, for their winter season, they will return back to their duller and more camouflaged plumage.

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## **ETNTRODUCING THE NEWBEES**

Hey!

My name is Filip (but I'll also answer to Floop), I am 18 years old and I am in my first year of the Bachelor in Biology. I'm quite passionate about biochem and cell biology, so you might find me at my desk. Other times, you'll

Răzvan

Filip

find me doing the things I most enjoy in life: like loudly singing along to songs, drawing bad sketches, reading more books, or playing way too complicated board games. On the off-side I'm not doing any of the above, you could probably find me either baking a new dessert or drinking coffee that is 2 spoons of sugar too sweet. I usually get carried away with anything I become a part of so I'm excited to see how being a Lifeline newbie feels like. I can't wait to share this amazing experience with all of you! Hey all!

My name is Violet. I'm 22 years old and born and raised in the

countryside of Groningen. I just started my Master's in Marine Biology, and I'm very passionate about all the creatures living below the waves, from the cutest to the weirdest. Besides biology, I really love cooking and eating (which I think is a great combination). I'm also really fascinated by the different languages and cultures around the world, and am currently learning Swedish. In my free time, I love playing games with my friends, like Dungeons and Dragons or Pokémon. I'm very excited to be a part of Lifeline and I hope to help create something you'll love to read!

# Hello!

I am Antigoni Papadhima and I am truly excited to be a new member in the Lifeline committee! I come to this group with eagerness to learn new skills and share them. I am 19 years old, and I am in my second year of BSc Biology and I come from Athens, Greece! In my leisure time I like dancing or doing sports, hanging out with friends, watching movies, or listening to music, especially while cycling. I also really enjoy reading adventure and fantasy books! My goal

in this committee is not only to be a simple member but also make valuable friends and contribute to the shared mission of the committee to create editions of qualitative content that would attract all our fellow students!

Antigoni

#### Heya!

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My name is Răzvan (weird name I know), I'm 18 years old and in the first year of my BSc in Biomedical Engineering.

I'm a real physics and biology enthusiast, but

besides that, I love listening to music, partying,

hanging out with friends, running, and doing some graphic design.

I always love to work with passion and to always respect my values, which will be present in my Lifeline Journey. I can't wait to work with my new colleagues and see what great things are coming. I am always enjoying surprises and new things, but at the same time, open to challenges and finding ways of solving problems that inevitably occur.



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## NO BODY, NO CRIME

#### HOW TO GET AWAY WITH MURDER

You can call me crazy, but I know for a fact that we have all been \*this\* close to taking drastic measures to get rid of that one person who gets on your nerves like no one else could. Yet, for better or worse, we never take that step. Maybe because

we see the second, or to face

good in bad people and have them deserve a third, chance. But maybe we just do not want the consequences of committing murder. Because let's be honest, we wouldn't survive prison. But what if we could have our cake and eat it too, doesn't that sound absolutely wonderful? So let me introduce you to a quick guide on how to get away with murder.

#### 0. Choose your victim carefully. 🔽

This is not really a step since you probably already have one in mind. Tip: if you classify yourself as a 'husband', never choose your wife, as you will be the primary suspect. With that said, I trust you on your judgement, so let's continue.

#### 1. Unalive them.

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There are many ways to go about this, some options are better than others. A general rule of thumb is: the less weapons, the better. Because every tool that is used has traces on it that can lead the detectives to you. So, unless you want to have to get rid of the evidence I would not recommend using a traceable weapon. But then what? You might ask, well a gentle push will go a long way. Taking a look at our surroundings, the Zernike campus provides a plethora of high buildings great for a free fall. Do however keep the camera surveillance in mind. A fall can also be of great use to get them to the ground and give



you the time to hit them with the final blow. Tip: if you prefer a more subtle approach, you might want to get familiar with their allergies and medical history and use the information in your favour.

#### 2. Hide the body. 🗌

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This is the real deal. This will define if you will get away with murder or not. Since this takes a lot of consideration I will explain a few of the options you have.

#### 2.1 Leave it.

A very effortless option. You just make sure it looks like an accident. "Oh my god he just tripped and fell off the roof of Linnaeusborg" is the attitude you need to have. A solid option if you can lie and act well in an interrogation, otherwise please keep reading.

#### 2.2 Light it up.

This sounds effective, but don't be fooled. Using ever developing post-mortem computed tomography tools forensic experts are sure to be one step ahead of you at all times. Using these PMCT scans after a fire a variety of things can be concluded. Based on the exact body posture after a fire, a natural (carbon monoxide inhalation) death or a murder cover-up can be

determined. When suffocating in a fire your body will be in a crawling position heading to the nearest door or window. Whereas when the person was already dead before the fire started, the posture reveals there was no attempt to flee made. Besides posture, the investigators look for tomographic features to be able to identify the burnt victim as well as find accessible blood that can be tested. And last but not least, the advanced CT scan can give insights as to how a person died. Bullet holes, skull fractures, and other distortions can be seen even when the body is charred. A very useful tool in forensics, but one you don't want to mess with.

#### 2.3 Dump in the forest.

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Seems to work well in the movies. Just dump them and cover them with a pile of leaves. Especially during fall, there is a plethora of leaves and sticks to cover up a body with. But chemists are expanding their skillsets and can take samples of the soil from underneath the body. The elements, like calcium and magnesium, found in this soil can determine quite precisely







when the body was put there. When a body is hidden, together with the estimated date of death gives a pretty clear picture of where the police should be looking. As long as the body is still physically a body, the soil will always reveal the truth about the timing. Not ideal in my opinion.

#### 2.4 Throw in the ocean.

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Splish splash, just add them to the ocean trash. In your mind a bloodthirsty shark will pop up immediately and devour the snack you just gave him with a cheshire cat smile... But then you remember you live in Groningen. Nonetheless, open water is still an option. When it's cold outside, the water

Food

temperature is also low. This will cause the floating body to decompose a lot slower compared to normal

dry decomposition. Once the

body is removed from the water however, it decomposes at a much faster rate. Even though there will be no sharks, predation by insects and animals may cause external harm to the body, making it harder to identify your victim and define the cause of death. When done right, water might work in your favour, hence the popularity of this method.

#### 2.5 The Breaking Bad way.

The most iconic method has to be hydrofluoric acid. The acid is flesh-eating due to the fluoride in it. It dissolves a body completely, however, not as fast as on TV, so be patient. And make sure

to use the correct plastic containers (PTFE) to prevent dissolving the body together with your bathtub ;) This method is very effective for getting rid of the body completely. But do keep in mind that you will need to get rid of the plastic container afterwards. You should



also get your hands on a large amount of hydrofluoric acid without raising eyebrows, so good luck with that.

#### 3. Get an alibi.

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No matter which path you decide to

take, it is always best to have an alibi. For your alibi make sure you are with someone doing something rather specific at the time of death/ disposal of body. Like at an IduNight with your committee members, where you make



sure to be in Papzie's pictures at least two times. After your quick photobomb you can leave (no one notices anyways) and congratulations, you secured yourself an alibi. You can get creative with this one, but never ever say you were home alone sleeping.

**Disclaimer:** I would like to state that I am not liable for any failed, nor successful, attempts to get away with murder. This article is for entertainment purposes only. Idun does not endorse actions that result in death, also not when the person deserves it, sadly. With all that being said, I wish you the best of luck getting away with murder ;)

### I DON'T START SHIT, BUT I CAN TELL You how it ends

#### GLV Idun

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December is approaching at a rapid speed. The month of Christmas trees, fireworks and familial obligations. But the one I personally find the most fun is Sinterklaas (the superior of Santa Claus). This holiday is not only focused on gifts given by a (creepy?) old man, but, like many other holidays, has a big food element tied to it. Because who doesn't like a good holiday snack?! Those of course being 'Pepernoten' (translated: pepper-nuts). Small crunchy bites available in the fall and winter. They are a staple in every Dutch household this season and for good reason. The classic is, well, classic, a solid 10/10... With one problem: once you start eating, there is no stop. Over time, many, many, many different variants of pepernoten have become available in supermarkets. For example with different kinds of chocolate coatings, but also with unique flavours. To help you make a good choice of pepernoten this year, we gathered all of our certified pepernoot-reviewers and got four rather unique flavours to review for you today. Our experts rated the taste, look, smell, and if the name was somewhat accurate to the flavour. From worst to best I present to you the official Lifeline pepernoten review:

We got the pepernoten from Van Delft (a pepernoten store in Herestraat). One thing that immediately caught the attention of Jente and yours truly is that "the pepernoten are too small". Because when it comes to pepernoten, *size matters*. After our initial observation, it was time to dig in.





## THE E-NUMBER IS TAKING OVER

#### Cherry Cheesecake

First up the cherry cheesecake flavoured pepernoten. With their hot pink coating they are the brightest of the bunch! A feast for the eye, however, this screaming colour was perceived as artificial by some of our reviewers and as super cute by others. So it depends on how much you like the colour pink if you find this one appetising or not. The smell was also as chemical as their look. As our seccie pointed out, they "smell fake". Ignoring the E-numbers density in the little tiny pepernoot, we dared to take a bite. And sadly, the taste was not as bright as the crushed up insects that were used for the colour. It is sweet, chemically, and reminds a few of us of the pink bubblegum we ate as a child. It did remind us of artificial cherry flavouring, but the 'cheesecake' part was nowhere to be found. This is not the best in our humble opinion, and like Chay said "I don't want to eat a cheesecake crunchy thing". Which we agreed with. Let cheesecake be cake, let pepernoot be pepernoot.

#### Sex on the Beach

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A promising name for a bag of pepernoten and we sure hoped it lived up to the name. However, we were very divided on this flavour. With grades ranging from 3 till 8.5, this is really up to personal preference. The look of this one is just fine, it is unique as it is orange, which reminded Alessia of Kingsday, but there is nothing too special about it. The smell of this one was perceived as mainly two things: sweet and peach. With variations such as peach ice tea, Jamin-store and Skittles being used to describe

Every day, we have to make hundreds of little choices. Some affect our future, and some don't. We want to make your life easier by taking away the stress you face when making insignificant choices. We gather our most qualified and opinionated members to review for you! This edition we took on the hard task of tasting a classic Dutch treat. Buckle up and get ready for Lifeline's iconic review!

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the smell by our lifeliners. The taste is where our group of reviewers divided. There was a group of us, me included, who found the taste to be that of white chocolate and orange. Yes, it's sweet, but that's to be expected. On the contrary, some Lifeliners found the taste to resemble a floor cleaner. I suspect because some cleaning products have a citrusy smell, but it does make me wonder what they clean their floors with... As far as sex on the beachyness, we did not really feel the cocktail. We mainly felt some peach smell and orange taste. However, Jente pointed out that she could taste the vodka (there's no actual vodka in it though). You will either love or hate this one it seems. Maybe first ask yourself what floor cleaner tastes like to you before buying.

I know, I know, I know, bananas are yellow. BUT, there is no

reason to make a pepernoot yellow. This colour really threw

our appetite off. Even more so than the pink did. Some trusted

lifeliners started making associations with the colour which did

not make them seem more appealing. Our honorary lifeliner

Anette commented that it "looks like diarrhoea" and Marit

referred to her Texel-ness by saying "it looks like seal poop

when they are sick". These associations are fair, but don't give

the banoffee flavour high hopes. Though, surprisingly, the taste

is much better than the look. It's all about what's on the inside

LOOKS LIKE DIARRHOEA, TASTES

**VERY MUCH LIKE BANANAS** 

at the end of the day kids. The taste is that of typical chemical banana flavour; to some this is the worst, but to many lifeliners this is the best. "Tastes like Haribo bananas" according to Jente. And Gintare, who simply loves banana flavouring, gave them a solid 10 for that fact. We all agreed



that the banana flavour was there, whether we liked it or not. But the toffee flavour was nowhere to be found. We think the pepernoot can be renamed to just banana.

CECILE

#### Apple Pie

Thus far our reviewers have been quite critical. Nitpicking on the little details and aftertastes, rating it rather harshly. When you thought we had no sprinkle of positivity left in us, here is the last pepernoot flavour: apple pie. This is by far the best one. It has an appetising rustic look to it, and smells delightful. "Smells like a cinnamon candle" according to Marit. The taste of this one is what really made all of Lifeline really happy. Nostalgia hit us like a full-on rainstorm in the peaks of fall. It was there and we were soaking. "Feels like Christmas" said Gintare, "tastes like my grandma's apple jam" added Anette. The extreme cinnamon taste made us reminisce about the cosy months with scented candles and apple pies and grandma's in kitchens and warm blankets. There was a hint of fruitiness which we defined to be apple, but there was like 80% cinnamon which we loved!!

#### Conclusion

Out of all the flavours we tried today, you are highly recommended to go and get the apple pie flavoured pepernoten.

Reviewer	Banoffee	Cherry Cheesecake	Sex On The Beach	Apple Pie
Alessia	6.5	0	5	9
Anette	4	5	3	9
Cecile	6	4	7	9
Chay	6	3	4	6
Gintare	9	7	7	9
Jelle	8	6	5	8
Jente	6	5	8.5	7.5
Marit	5.5	3.5	6	8
Michelle	6.5	6	5	7.5
Total score	6.4	4.4	5.6	8.1

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#### GLV Idun

Banoffee

## **BAS EN Z'N BEESTJES**

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### **BEASTS BY BAS**

you get. Small innocent babies look cute while adult predators a mucus bell you can blow out of your nostrils! look vicious. Nobody who sees an adult lion will think this an innocent herbivore, or mistake a sloth for a deadly ambusher. But not this animal. I can only describe this animal as a big ball of blubber shaped like a sausage. You wouldn't guess that it shares an ancestor with a grizzly bear and likes to eat penguins by first skinning them then devouring them whole. Maybe that's why they share their name with America's most elite army unit. However, while their appearance might seem somewhat mismatched with their lifestyle there are still more than enough fascinating things to tell about them. Let me introduce you to the stealthy super sea-sausages better known as seals.



Seals are a clade of Pinnipedae which consists of three families: Odobenidae (walrus), Otariidae (sea lions and fur seals) and the Phocidae (true seals). Seals are distributed along both Arctic regions and the seas except for the Baikal seal who lives entirely in freshwater. Seals show an impressive variety in their mating efforts but it is usually the male that tries to impress the females. Some of them, like both species of elephant seals, do that by sheer weight and size. These seals, which can weigh up to 3750 kilograms, are the heaviest carnivores in the world. They live in a harem structure and defend these harems from other males with intense sumo-wrestling fights. These fights can be deadly, usually not for the males themselves but for the innocent bystanders. Both females, which are 10 times as small, and especially pups are not safe from the equivalent of two Volkswagen minivans rolling around. One colony can even lose up to two-thirds of its pups in one mating season. Other male seals, such as the hooded seal, try a somewhat more fashionable approach to attract a mate. They get their name from the nasal sack of skin on their forehead which they use for acoustic communication. However, in addition to that nasal cavity they also have a pinkish balloon-like nasal membrane stuck to their left nostril which they can blow up to attract some

Evolution is often very straightforward: what you see is what females. Because nothing is sexier than showing off how big of

**BAS VAN** 

**BOEKHOLI** 

Though seals may seem like good mothers, they are only there for a very short period. Of all mammals, seals nurse their offspring the shortest with the hooded seal as the absolute peak. If you are a hooded seal pup you only get four days before you are weaned off and have to survive on those fish and crustaceans alone. To adjust for their short nursing period seals do have the most nutritious milk of all mammals. Their milk has the highest percentage of fat (up to 60%) and therefore sometimes looks more like pudding. If it tastes like that too is still up for debate.

But while these animals might seem slow and clumsy on land, they shine in their natural hunting grounds underwater. They are deadly quick and are built to stay underwater for long periods of time. When they dive they deflate their lungs and fill up their middle ear cavity with blood to avoid big pressure differences. Under water, they live entirely on the oxygen in their blood and therefore, usually have more haemoglobin in their blood (the stuff that binds oxygen) and just generally more blood mass than any other mammal relative to body size. Another key adaptation they have is that they're able to lower their heart rate to a mere four beats per minute. Just imagine walking from Linnaeusborg to the AH to Go and back while your heart has not even reached double digits. Using these crazy adaptations elephant seals can stay underwater for over 2 hours diving as deep as 1,5 km. However, going down that deep takes a lot of time which could be spent getting food and to quicken their descent, some individuals even swallow some stones to sink faster. Hunting in the dark deep means that seals need to rely on other senses and here they make use of an interesting mechanism. Recent research has found that the unique shape and rippled structure of seal whiskers are key to NOT creating vortices and this in turn makes them hypersensitive to vortices created by anything else. Using their whiskers, seals are able to sense the presence of the tiniest fish from across the distance of an Olympic swimming pool.

As you can read seals are ruthless, from their short childhood through to their hunts and their behaviour towards the other sex. They are the pinnacle of their biome, both on land and in the sea. Scots were convinced that seals would come out of the water and transform into beautiful women who would drag men into marriage and a watery grave. That is some other little mermaid fable they never tell you. So next time you see a sausage-shaped blubber ball chilling on the beach and you feel strangely attracted to it, look at it and admire it, but for the love of god and your own safety, do this from afar!

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THE IDUZZLE YOUR FAVOURITE PUZZLE

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The previous Iduzzle was won by **Wiep Silvius and Andreea Ghiata**. Congratulations! They have won a marvelous prize, which they are very happy with! Would you like to be mentioned here in the next Lifeline? Please submit your answer to the Iduzzle to redactie@idun.nl before January 10th.

Answer to iduzzle 72: What blooms from beautiful seeds of thought becomes a symphony of colourful abundance

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