



# CONTENTS

SCIENTIFIC NEWS

4 5

TIME CAN HEAL

6 7

RHYTHM OF LIFE

8

9

MARIT'S MYTHBUSTERS

TIME  
WILL TELL

10

FOREVER YOUNG

11

IDUN PHOTOS

12 13

SLEEPDEPRIVATION

14

I'LL DO IT  
TOMORROW

15

WHEN IT'S  
TIME TO GO

16

TIERLIST

17

TO AGE OR NOT

18

TIMELINE  
OF LIFE

19

REVIEW

20 21

BAS EN  
Z'N BEESTJES

22

MEME

23

IDUZZLE

24





Sweet young & old Idunaren!

It is only appropriate to start this Lifeline with a celebration. Happy 70th Lifeline! For 70 editions Lifeline has been here to entertain you during your long days on campus and providing you with countless fun science facts. We have dedicated this jubilee Lifeline to T I M E.

During this rapidly developing era, time is something we all are very aware of, especially the lack of it. Don't despair, be patient, because, usually getting older is correlated with having more and more time. Therefore we, the Lifeline, now at issue 70, have taken some time to write about....well....time. In this edition you can learn all about biological clocks, aging, what happens to your body when you don't have the time to sleep, and those times when you just postpone everything you are supposed to do. Maybe some of you are even procrastinating right now; reading this Lifeline instead of finishing that lab report. We got your back! In these dark winter times, please don't forget to reserve time for yourself, self care is important! Make yourself a cup of tea, get a pen ready to solve the Iduzzle, light a candle, crawl under a blanket or two and have a nice read!

Warm hugs,

*Anette Hallik*

Editor in Chief

Dear members,

This is already the second Lifeline of the year, it is funny how time flies by. Time is described as the progression of events from the past to the present into the future. Basically, if a system is unchanging, it is timeless. Time is often considered to be the fourth dimension of reality, used to describe events in three-dimensional space. Even though we can only perceive time at the present, it plays a huge role in our everyday life. We live by our schedules; time management is increasingly important. While keeping a schedule makes sure that we can function optimally, it can sometimes prove very stressful. For this reason, it is very important to take a break from your schedule from time to time; plan moments where you can truly choose how to spend it, for example by reading a Lifeline ;). As time passes by we can sometimes forget to stop our routines and enjoy the moment.

With kind regards,

*Jippe Jansman*

Chairman of GLV Idun 2022-2023

The Lifeline is the independent textual organ of the Groninger Levenswetenschappen Vereniging (GLV) Idun and is released quarterly.

Number of copies: 350

Printed by Orangebook, Rijen, January 2023

Editor in chief: *Anette Hallik*

Editors: *Michelle Berendsen • Marit Bonne • Cecile Bruil • Anette Hallik • Stein Hegeman • Jelle de Jong • Eva Lemson • Alessia Palazzo • Gintare Petraityte • Ella Rees-Baylis • Clara Seinsche*

Lay-out: *Michelle Berendsen • Marit Bonne • Lisanne Leenheer • Eva Lemson • Alessia Palazzo • Gintare Petraityte • Clara Seinsche • Jente Zeubring*

Final editing: *Marit Bonne • Anette Hallik • Jelle de Jong • Ella Rees-Baylis • Chay Wessels*

This edition features contributions by *Bas van Boekholt*

None of the contents of this edition can be copied, multiplied or published without written consent by the editors. Due to the fact that the editors depend mostly on input from third parties, the editors cannot be held accountable for inaccurate information. The editors or GLV Idun do not necessarily endorse the views of published pieces. All authors must be known by the editors. Membership GLV Idun: visit [www.idun.nl](http://www.idun.nl)

Cover page designed by *Jelle de Jong*





# SCIENTIFIC

## NEWS

### Reaching the finish line in no time

By Cecile Bruil

Doping, steroids, anabolics. All enhance your performance in those very important seconds of your life if you are an athlete running the 100-metre sprint. Ready, set, GO! It's time to go, outperform everyone, even yourself using supplements. Illegal, ofcourse, that is why professional athletes get tested for drugs before/after the game. But what if you could enhance your performance a little in a more innocent way. In a cosy-cup-of-coffee way. Caffeine stimulates the nervous system. This is known for quite some time now, but researchers still had to measure the exact effect of caffeine on sprint performance. Hence why they tested it. After various trials with a caffeine or a placebo supplement, the performance of the athletes increased significantly. The running time after getting caffeine decreased by 0.14 seconds! This might not seem like a lot, because it isn't for non-athletes, but 0.14 seconds can very well determine the difference between a gold medal or a mere 4th place. The increased speed was mostly observed in the first 20 metres of the sprint. With there being no difference in running speed in the last 40 metres compared to controls. The study suggests that caffeine enhances performance by making the acceleration more explosive. So coffee can make you run just a teeny tiny bit faster.



### Scientists created a wormhole

By Gintare Petraityte

Well, not exactly the kind that Matthew McConaughey used to enter the planet-rich part of the universe in 'Interstellar', known as the Einstein-Rosen Bridge. It is more like a baby wormhole or a simulation of one. Scientists from Harvard, MIT, and Caltech have simulated two black holes on a quantum computer and sent a message - a quantum state - between them through a shortcut in space-time called a wormhole. They have used machine learning to make this massive quantum phenomenon simple enough to be stimulated by an existing quantum machine while maintaining a reasonable model of a wormhole. Therefore, the black holes used as the entrance to the wormhole are just as real as the ones you can draw on a piece of paper, and they are not capable of swallowing the matter around them. However, this experiment carried out on Google's quantum processor helps to understand the relationship between gravity and quantum mechanics, a prediction known as quantum gravity. It is also one of the bigger steps in a new era of experiments using quantum computers to study quantum mechanics, string theory, relativity, and other scientific mysteries.







## It's about time: The metric system got an upgrade

By Jelle de Jong

Rejoice, our favorite system for counting just got an expansion. Using prefixes to describe large or small numbers is a part of daily life for most of us. Among the most well known prefixes are kilo-, mega- and giga- as well as milli-, micro- and nano-. Until recently the boundary was set at yocto- and yotta-, which stand for  $10^{-24}$  and  $10^{24}$ . This November it was decided to add four new prefixes to the list, to keep up with the ever growing need to describe the tiniest and biggest of numbers. Two of the new prefixes are ronna- and quetta-, which stand for  $10^{27}$  and  $10^{30}$  respectively. Never before was it this easy to express the mass of our favorite objects in grams, be it the tiniest of particles to the biggest of planets. For the first time we can say that our rocky planet's mass is about six ronnagrams, while Jupiter's is two quettagrams. With the other two prefixes, ronto- and quecto-, which stand for  $10^{-27}$  and  $10^{-30}$ , the tiniest of particles can now be expressed in grams. For example, the mass of an electron is approximately one rontogram, isn't that convenient? To all those who still measure with primitive imperial units like stones, cups and sticks; please adopt the metric system, leave the awful conversion chart behind.



## Lunar cycle makes mangroves flourish

By Stein Hegeman

Mangroves, those weird looking trees that provide habitats for beautiful creatures. No wonder people are afraid of losing this in the future. However, time showed scientists we do not have to fear, because our moon will be this forest's savior. Like every biome, mangroves also face many threats like pollution and agriculture. Environmentalists at Macquarie University in Sydney wanted to know how this affected growth and turned to satellites from NASA to look at data from 1987 to 2020. After calculating the size and density change of mangrove forests over time across Australia, the researchers noticed a curious pattern. Mangroves tended to expand in both extent and canopy cover in a predictable manner. Because the moon controls the tides, which deliver water and necessary nutrients to the trees, the team of scientists hypothesized the lunar cycle could explain this growth pattern. Over the course of years, the plane of the moon's orbit slowly tips. When the moon's orbit is the least tilted relative to our planet's equator it causes tides to have a larger range, thus between the roots of mangroves as well. The lunar cycle even appeared to overshadow other climatic factors for growth, such as El Niño. So although data from the past may seem useless then, in time it can teach us surprising facts.



# TIME CAN HEAL MOST ANYTHING

Time, mystical time, cutting you open, then healing you fine. At least, that is how it usually goes in the case of heartbreaks and gaping wounds. But in the case of brain alterations, there is never a full return to how it was before. This might seem like common sense, but throughout history the human brain and skull was messed with a lot, in hopes of improving it, but often having the exact opposite effect. Let's take a trip down memory lane and amaze ourselves with the ancient brain deformation techniques which are now luckily well in the past. Starting with the least severe alterations and moving our way up to severely unhinged psycho surgery.



## Cranial elongation

Aesthetics have always been of interest to humans. Tattoos, piercings, plastic surgery, we alter our bodies permanently to look different, preferably better. One type of modification is cranial elongation. It is very common throughout history, starting around 700 B.C., and still somewhat exists in our society today, mainly in some African tribes. This technique consisted of elastic bands

strapped around the head or an apparatus which tightened the skull so much that the cranium would be elongated, resulting in a head with a much larger skull than normally. Nearly every culture on earth has at one point practised this type of skull modification, mostly for aesthetic purposes and to show your wealth and class in society. To make sure the elongation works, the process should start as soon as possible. Children of just a few months old were already strapped into a device that looks like something straight from a torture room. Even though the skull looks very different than normal, the elongation did not do too much damage to the cognitive functions. The process of elongation can be painful and tense at times, but the process is so slow, that all the brain areas get pushed around in the cranium, but they won't deform nor alter cognitive functions. Therefore this is the least damaging modification we will discuss, but once the elongation is done, it can never be returned to a normal state.

## Trepanation

This very ancient technique, and I mean hunters and gatherers ancient (around 6000 B.C. to be more precise), is one which raises many questions. The word trepanation comes from the Greek word trypanon which literally means 'borer', this is because the technique consisted of boring holes into the skulls of living people using sharp metal objects. But why would you ever bore holes into someone's skull? And they are not small either: the holes can be several centimetres in diameter, causing a pretty big piece of skull to be missing. Also, why were there so many more male skulls with signs of trepanning than female skulls? We will never be able to get a definitive answer, but the most likely theory states that trepanning was used to relieve pressure



in the skull, after, for example, a hunter got unconscious after a fight with an animal. This would also explain why more men have trepanation signs, as the men were most often hunting, while the women were gathering goods. The surgery would most likely be performed to 'wake the patient up'. Surprise surprise, it even worked (or it seems like it), because there are quite some skulls found which show signs of healing, indicating that the patient lived at least a couple of days after the surgery. Not everyone was that lucky, as there are also many skulls with a 'freshly cut' trepanation hole, indicating that their last breath was exhaled on the surgery table. Also note that surviving at least a day, is exactly that, researchers find it very unlikely for the hunters



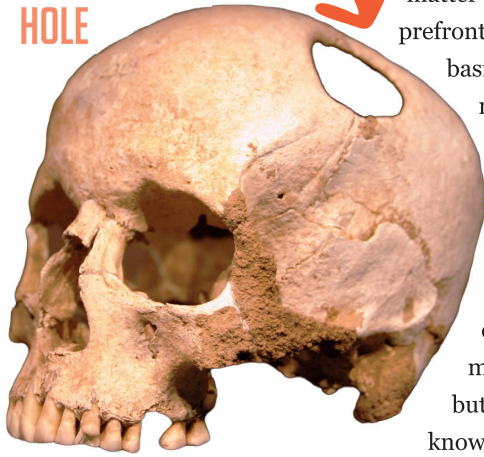


to have lived over 14 days after the surgery. It worked when it worked, it didn't when it didn't, you would die either way

### Lobotomy

Are you struggling with anxiety, OCD or chronic pain?? Grab an ice pick, and let's fix it. The last technique in this article is certainly the most cruel and life-altering. You might have heard about it, as it is fairly recent that it has been banned. I am talking about lobotomy, although it started out as leucotomy. This predecessor was invented by a Portuguese guy named Antonio Moniz, he thought of a way to cure all mental disorders out there, namely

### TREPANATION HOLE

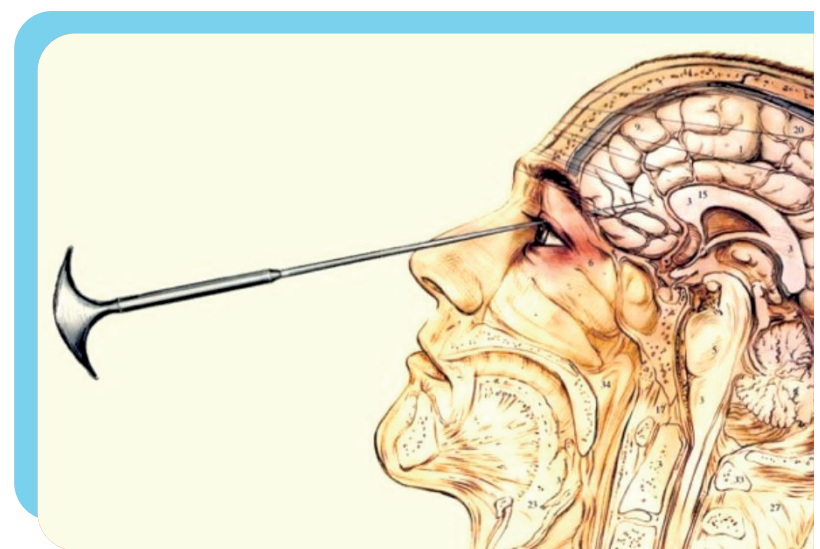


by breaking apart the white matter connections in the prefrontal cortex. The very basic logic behind this makes sense: undo the 'wrong' brain connections which cause the mental disorder. But in practice the connections are far more complicated, but that was not well known at the time. The

leucotomy consisted of drilling a hole on either side of the skull and infusing the prefrontal cortex with alcohol to damage the brain tissue. This yielded bad results with a side note of some promising cases. And it is these promising results that got Walter Freeman thinking... He adapted the procedure to make it more accessible: stop boring holes in the skull, quit using alcohol, and cut down the elaborate procedure of surgery. Instead, make it a quick 10-min psychiatrist procedure using an ice-pick and a hammer. Use the hammer to slam the ice pick through the eye socket and into the prefrontal cortex, then pivot it around to disrupt the brain tissue. This procedure was so doable that it spread throughout the world, but was most common in the USA and in Europe. In the USA, over 40.000 lobotomies have been performed. But how bad is this procedure? Sure it sounds like torture to be stabbed with an ice pick, but it must have solved the patients complaints for it to be performed so often right?... right? NO. Nearly all people that underwent a lobotomy suffered from the same complaints as before, but more importantly, they became zombies. They lost large parts of their personality, they were not the same as before. Some got seizures, were chronically confused, and lost their sense of self. And that is for the surviving people in which the procedure was successful, this was not a foolproof procedure. You can't expect poking the

brain 7cm deep to go well all the time. Around 15% of the time, the lobotomy patient died. Oh and remember that guy Freeman, who made the lobotomy easier to perform, yeah he had gotten quite comfortable with ruining people using ice picks. He even performed lobotomies on children aged 12! In 1967 Freeman was forced to quit performing lobotomies for the rest of his life when yet another patient died. The entire procedure was banned in the rest of the world shortly after. One case example is that of Rosemary Kennedy, sister of president JFK, who suffered from mild cognitive impairment due to a lack of oxygen at birth. When her father forced her to get a lobotomy, however, it went horribly wrong and her competences got reduced to those of a 2 year old, never regaining the ability to walk or talk. Her story (which I recommend looking up as it is crazy) is, like many others, tragic. All patients' stories are horribly tragic and patients ended up as a shell of what they once were. Therefore I can't fathom that the lobotomy got the Nobel prize for medicine. Lobotomies truly belong on a dark page in history.

Time has taught us many lessons. And has shown that one of these things is not like the others, you can deform a brain with and without severe damage, and you can die in the process or live to tell the tale, but no matter the outcome, the process can't be reversed. And time will not heal you... Time might improve your trepanation wounds just a tiny bit, but definitely won't fix the brain damage caused by an ice pick or return the shape of your skull after artificial elongation. They say all's well that ends well, but a successful trepanation or lobotomy leaves you just above



death. Lucky for us, these techniques are in the past, buried in ink letters on textbook pages. Never to be performed again, but with the aftermath of stories tattooed in our mind to reminisce about from time to time.



# RHYTHM OF LIFE

## THE IMPORTANCE OF BIOLOGICAL CLOCKS

By Alessia Palazzo



Everything in nature has a rhythm: the alternation of seasons, day-night cycles, moon phases, tidal cycles, and so on. Therefore, it's no surprise that organisms developed ways to predict the rhythmicity of the world. This gave rise to the so-called "circa" rhythms with the circadian (daily 24h) rhythm being the most famous. *But how does our internal clock work? And why are circadian rhythms important?*



Every cell in our body has a circadian rhythm. This is regulated by a transcriptional-translational feedback loop, a big and fancy term to describe the fact that clock proteins can inhibit their own transcription. There are two main clock genes in mammals: Clock and Bmal1. These bind and regulate the transcription of other genes including Period and Cryptochrome which have a negative feedback on the Clock - Bmal1 complex. The loop repeats every day with a period of approximately 24h.

*But if every cell follows its own rhythm, how are they synchronized?*

The suprachiasmatic nucleus (SCN) is the main pacemaker in humans: it communicates its rhythm to the rest of the body so that all our organs are synchronized. The SCN can drive the rhythm without any stimulus from the external environment (e.g., in complete darkness), but in this case it will follow its own intrinsic period which is close to, but not exactly 24h long. In chronobiology, we say that the rhythm is "free-running". But that's not the end of the story, because we live in a world with both light and darkness and we need to synchronize our bodies to those changes. Once again, the SCN acts as the main synchronizer: it perceives light from the eyes and synchronizes the internal clock to the external day-night rhythm, a phenomenon known as entrainment.

As I said, our internal rhythm may be longer or shorter than 24h (slow or fast clocks) leading to differences in time preferences that determine the chronotype. People with an early chronotype (so-called "larks") usually wake up really early in the morning and feel more productive in the first part of the day.

and feel more productive in the first part of the day. They need light in the evening in order to slow down their clock and adapt to the 24h day. On the other hand, late chronotypes ("owls") prefer the second part of the day and usually go to bed very late. So, if you feel that waking up early is difficult, try to get some sunlight in the morning to speed up your clock!

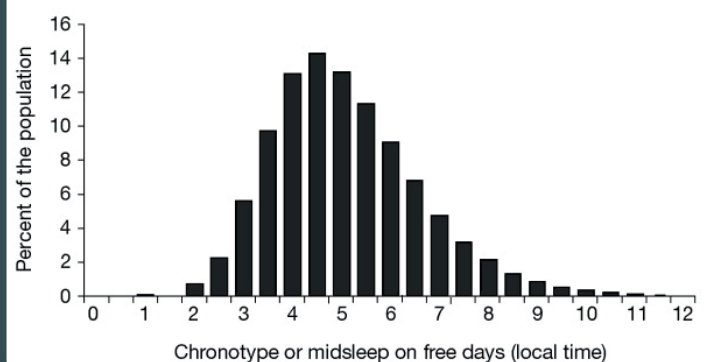


Having an early or late chronotype can influence many aspects of our life. For example, students that go to bed pretty late during the weekends and need to wake up early during school days experience the so-called social jetlag, a misalignment between the social and biological clock. Late chronotypes suffer a bigger "time difference" and social jetlag has been correlated with increased depression, sleep deprivation, obesity, smoking, and alcohol consumption.

In the last century, human artificial light in the evening (think about watching TV or being on the computer at night) has been delaying our circadian clocks leading to more people suffering social jetlag. But this doesn't necessarily have to be our destiny. Social time is a human invention and we can re-adapt it in a more conscious way. Dr Kantermann from the RUG is the leader of the ChronoCity project: a city in which sleep and circadian health are the priority and people can live according to their own clock. Just imagine for a second being able to go to class when your brain is most active, pretty cool isn't it?

### What's my Chronotype?

Here you can check your chronotype. You'll need to write down the time you go to sleep and wake up on a free day when you can follow your clock. The hour in the middle of your sleep window is your midsleep. For example if you go to bed at 12 a.m. and wake up at 8 a.m., your midsleep will be 4 a.m.







## "PERIOD SYNCING"

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.

### Menstrual cycles will synchronize when people spend a lot of time together.

It's like clockwork. Your mom, your friends, colleagues, yourself: once you start your monthly bleeding, everyone else suddenly is too! I used to believe that the closer your friends are, the more in sync cycles your cycles would be. It was so practical as well: if we were all on our period, we could seek comfort together and provide menstrual products to friends in need! Little did I know that science hasn't been able to find unambiguous results regarding time spent together and the syncing of people's menstrual cycles. Was it all a myth then?

The concept of period syncing roots in the study by Martha McClintock. She recorded the menstrual onset of 135 college women living in the same dorm. Her conclusion? The menstrual cycles of most of these women aligned! Afterwards, period synchronization had been referred to as the 'McClintock effect'. With this, the idea that social interactions could influence the menstrual cycle was born (and even still presented in current Biology lectures lol.

However, much more refined studies were needed to debunk, or confirm, the McClintock effect. Fortunately, the rise of period-tracking apps has made data on menstrual cycles easily available. This enabled the performance of a study in China to gather data from 186 women living in a dorm together. Some of them showed a synchronous period, but this effect was statistically insignificant. An even larger study was performed at Oxford University, where they collected data from 1500 people using the period tracking app 'Clue'. They busted the myth: being close to one another is very unlikely to disrupt one's menstrual cycle.

There might be another explanation for the huge amount of anecdotal evidence on period syncing.

A study in 2018 by Charlotte Helfrich and her colleagues revealed that the human menstrual cycle can be entrained to the moon. The moon?! Yes, the freaking moon. While the effect is very small, the menstrual cycle can be temporarily synchronous with the lunar cycles. So, sometimes the two cycles are synchronous, sometimes not – it is called relative coordination. To make it even more complicated: there are three lunar tidal cycles the menstrual cycle can be synchronous to, based on the position of the moon to the earth. It's too elaborate to explain here, but I'd recommend looking up the paper if you're interested! The study of Helfrich and colleagues raises the following thought: if people's menstruation can temporarily synchronize with the moon, then observed synchrony in periods with your roommates could be devoted to simultaneous entrainment to the lunar cycle? Pure speculation, of course, but an interesting thought nonetheless.

It is a heart-warming idea that spending time together will get human bodies in sync. Sadly, we only have anecdotal evidence to back this up, which is not enough for scientists like ourselves ;) We need way more research on periods to reveal the interesting things our bodies are capable of (such as entraining to the moon!

Sometimes debunking a myth reveals something even more fascinating; who knows, we might all be moon-people ;)



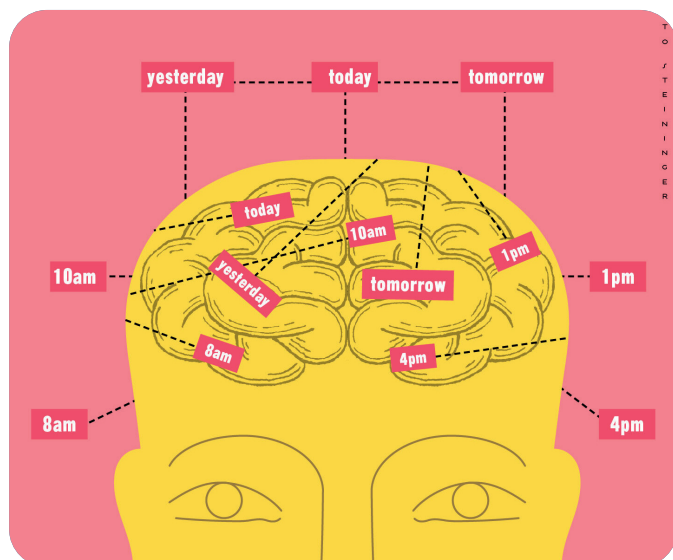


# NOT ONLY TIME WILL TELL, OUR BRAIN WILL TOO

By Clara Seinsche



Have you ever wondered how we tell time? In a world where we can always check the time, this might seem like an irrelevant question. Still, all humans share a common sense for time-related aspects, such as the duration and frequency of events and are able to link memories to their points in time.



Try closing your eyes and determining an interval of thirty seconds. Chances are that you will do pretty well - most people will be off by just 2-3 seconds. This is only one experiment to demonstrate that we indeed have a sense of time, but the question remains: What enables our perception of time? If we compare our ability to tell time with other sensory capacities, we would expect a sensory organ, which measures some kind of objective, time-dependent variable. While we do have such a system, namely our biological clock, which is responsible for regulating e.g. our activity rhythms and metabolism, it is something different underlying our subjective perception of time. While our central biological clock is circadian, our subjective time sense helps us to estimate the frequency of a clock pendulum, determine how long we have been working out or sway in memories from 15 years ago, covering a much larger range of time.

## So how does it work?

One intriguing theory is based on the observation that time is perceived differently at different ages. Accordingly, young children “live in time” and are mostly unaware of time passing. As their brain matures, they develop the capacity of storing short-term, and eventually long-term memories, while also gaining an increasingly accurate perception of time. As they grow older, subjective time speeds up. The theory then relates our timesense to the experience of novel stimuli: Children, who are constantly engaging with new environments receive a lot of new input, whereas adults, who are often stuck in routines, will

not be confronted with new impressions.

Another related idea is that stretches of time are measured in reference to one’s own lifespan, which also leads to a constant increase in subjective time speed.

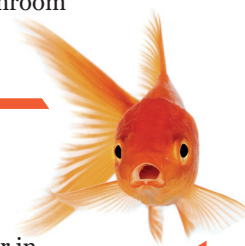
In contrast, more biological theories have linked our perception of time to different neurotransmitters. For example, dopamine activity in the basal ganglia might mediate second-to-minute intervals, while acetylcholine in the frontal cortex may influence temporal memory. Research in mice also showed that increasing dopamine levels in the substantia nigra makes time pass faster to them, as demonstrated by anticipatory behaviour. In humans, it is also known that different drugs alter our perception of time: Stimulants, such as caffeine or amphetamines advance subjective time speed, whereas cannabis is commonly reported to do the opposite.

The final theory I want to tell you about today – and my personal favorite – is one of several biological stopwatches. According to this theory, our brain should have multiple pacemakers, which fire at regular intervals (milliseconds, seconds, minutes...). These cells are always active, so any given interval responds to a specific number of pulses. The way these hypothetical “time cells” work is very similar to the way our spatial sense works: Here, different “place cells”, located in the hippocampus, fire according to our position in space, which translates to a spatial map in our brain. The theory of “time cells” was put forward already many years ago, but only recent research has actually provided evidence of possible candidate cells in the hippocampus.

Finally, as it is the case in many fields of research, the final answer is still to be found, but we have some promising theories. One very clear finding, however, is that our subjective sense of time is influenced by a range of factors, such as our emotional state, our biological clock, or on which side of the bathroom door we are on.

## Goldfish in distress

Wondering how to measure subjective time in animals? Most times, an animal will be conditioned to engage in a behavior in response to a certain stimulus. Often, animals will show these behaviors already shortly before they anticipate the stimulus. In one study, researchers administered regular electrical shocks to goldfish – once the goldfish had learned this, they showed increased general activity just before the next shock.





# FOREVER YOUNG

By Stein Hegeman



No, not like the song of Alphaville, I mean it literally. Nobody likes the thought of growing old. But, despite many human efforts, it seems to be an inevitable part of life. Why do organisms gradually fall apart when they grow older? The word for this is called senescence. Senescence is the deterioration in stages of normal functioning. On the cellular level it means cells will stop dividing and then eventually disintegrate. This can apply to an entire organism or to specific organs or tissues, like leaves falling from trees. Even though we have many ways to slow it down, at a certain moment senescence will occur. However, there are a few species that can escape the aging process at all times.

## The 'immortal Jellyfish'

Till this day, there's only one species that has been declared biologically immortal. This means it has a stable senescence. The jellyfish in question is *Turritopsis dohrnii*. These fairly small and transparent animals float around in all oceans around the world. They revert to an earlier stage of their life cycle, almost like they are going back in time. Normally when an organism reaches the end of their life cycle, it would mean their end. But *Turritopsis dohrnii* has a nice trick up its sleeve. When it faces a form of environmental stress, it may revert back to being a lump of tissue, which then changes back into the third phase of its cycle. You can compare this to a butterfly becoming a caterpillar again. Of course these jellyfish are not actually immortal, they can still be killed in other possible ways.

called FoxO. These are important in regulating how long cells will live. Hydra's seem to have a surplus of FoxO gene expression. Yet, it is still not clear how these creatures do this exactly, but FoxO genes must play some big role in maintaining the Hydra's youth.

## Lobsters

Although they are not quite 'immortal', lobsters do not experience senescence. Their longevity relies on them being able to repair their DNA endlessly. Naturally during the process of DNA copying and mitosis, the protective end-caps on chromosomes, called telomeres, slowly get shorter and shorter. When they get too small, the cell will enter senescence and can no longer divide. Lobsters do not have to worry about this problem. They possess a boundless supply of an enzyme called telomerase, that regenerates telomeres. This means lobsters always have youthful DNA. Telomerase is also present in most other animals, including humans. After they are embryos telomerase levels decrease and get too low to keep up with the telomere degradation. Unfortunately for lobsters they literally grow too big for themselves. Continually growing larger and larger, their shells can't change size. They have to grow a brand-new exoskeleton each time, which takes lots of energy. After many times, the amount of energy required is simply too much and the lobster succumbs to exhaustion or their shell collapsing.



## Hydra

Yes, this Greek creature does exist, just not as their mythological description. It is a very small organism that looks like a rod with several stinging tentacles. This animal is very simplistic and spend their life mostly in freshwater ponds or rivers. But, why do we claim it to be immortal?

Well, it seems they don't go through senescence at all. Instead of cells dying, a Hydra's stem cells have infinite self-renewal abilities Hydras may thank their 'immortality' to a particular set of genes

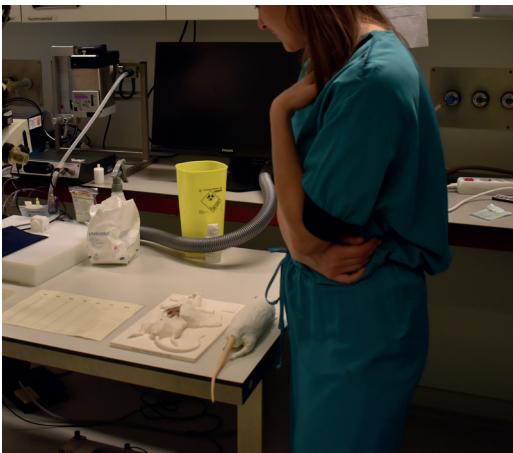
## Humans

Of course, there are many other organisms that offer glimpses to an endless existence. Will they provide the solution to eternal life for humans? It is known that aging in humans is due to multiple factors, many of which we still do not understand fully. But, do we really want to stay forever young, or do we just need to let time pass us by?











# SLEEP DEPRIVATION

## A STUDENT'S CURSE

By Michelle Berendsen



Everybody has times when they are way too tired, from partying with friends to late-night study sessions, to get themselves out of bed the day after. Voluntary sleep deprivation is extremely common among students. Multiple days of sleep restriction can feel physically draining, your mood becomes noticeably moodier, and your thinking skills and focus are extremely downgraded. Sleep is seen in our society as lost time, it is considered time that could be used for more productive purposes. Yet, insufficient sleep has major effects on alertness and vigilance, plus cognitive function also relies on emotional data.

Sleep is divided into four stages, with the first stage being light sleep. The second stage is again light sleep, but now characterised by a rapid burst of neurological activity. During this stage, short-term memories stored in the hippocampus are moved to long-term storage in the cerebral cortex, and this stage can also play a role in muscle memory. Stage three is deep recuperative (dreamless) sleep and the last stage is called REM sleep (dreamless), both stages have consolidation of long-term memory. Also stage three is known to clear metabolic wastes from the brain. The third and REM stage continues throughout the night at 90-minute intervals. Most people go through these cycles four to six times a night. When a person is chronically sleep deprived, stage one and stage three sleep are maintained, but stage two and REM are proportionally reduced in response to limited sleep time. For example, waking up two hours earlier reduces your total sleep time by two hours, thus loss of 25% of recommended sleep, but it also results in a 50% loss of REM sleep. Studies show that people who follow a sleep schedule of four to six hours a night for two weeks have insufficiently recovered after two days of sleep recovery. This study also shows that two weeks of chronic sleep deprivation exhibit the same performance limitations as acute total sleep deprivation.

In addition, sleep specifically acts on the prefrontal area of the brain and affects planning, decision-making, social behaviour and the connection between prefrontal and limbic brain regions. Mood disorders can be lifelong problems that interact with sleep. People with anxiety and depression have less sleep at night, but reduced sleep also causes symptoms. Some other well-known sleeping disorders are DSPS (Delayed Sleep-Wake



Phase disorder) and insomnia. These disorders are the most common in adolescents. DSPS is affected by homeostatic drives to stay up longer and take longer to fall asleep. The cause can be a mismatch between an adolescent's preferred sleeping time and their social demands such as school which results in chronic sleep restriction. The other disorder is insomnia, whereby people have difficulty falling asleep or staying asleep due to intrusive thoughts and anxiety.

Finally, I will give you some tips on sleep that will help you get a good night's rest and hopefully lead to less sleep deprivation. First of all, try to be active during the day and absorb enough daylight to feel awake and release your energy. Power naps are acceptable but do it before 15:00 for a maximum of 30 minutes. Secondly, keep your room cool and ventilated and your feet warm, with a good hot shower or fluffy socks. Third, try strict bedtimes and wake-up times so your body can accumulate more easily. Fourth, do not use caffeine after 6 p.m. Even if you think you can sleep through it, caffeine still affects sleep quality, and also don't use alcohol as a nightcap. Finally, to reduce anxiety and fall asleep peacefully, write a worry list at the end of the afternoon. If you cannot sleep, get out of bed for 20 minutes and do something relaxing. Also, try to think about calmly staying awake instead of forcing yourself to fall asleep.



# I'LL DO IT TOMORROW

## THE STORY OF PROCRASTINATION

by Anette Hallik



Picture this: it's Friday. There is a deadline on Monday evening. When are you gonna do the task? Now? On the weekend? Let me guess.....Monday!

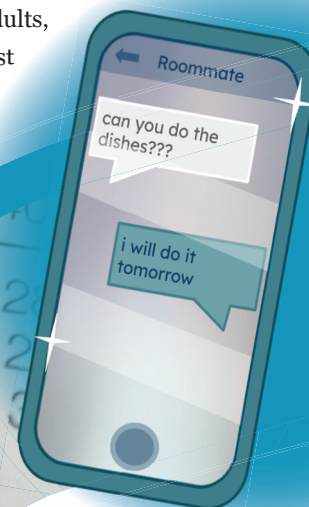
Procrastination is something we are all familiar with. Putting off assignments until the last minute, not calling about that doctor's appointment for months, or waiting to take off the laundry from drying. Virtually any task is procrastinatable, sometimes procrastination is so powerful that one starts cleaning the whole apartment or organising finances just to avoid another task. This way we could even call procrastination the cure of itself.

Older generations love to blame the internet for procrastination, calling it a 21st century disease. But video games, social media and vastly developing virtual landscapes are not to blame. Humans have been battling with procrastination since the dawn of civilizations. 'Put your work off till tomorrow and the day after' wrote Greek poet Hesiod long before Christ was born. So take that boomers, and admit to yourselves that even you procrastinate sometimes. Nonetheless, there is negative correlation between age and amount of procrastination, where older people postpone their tasks less than youngsters. Anyhow, there is nothing to be ashamed of, we all do it; it's just brain science. Very often

Nevertheless, there are different types of procrastinators. Firstly, all who procrastinate are not procrastinators. All people can occasionally procrastinate, but there are those who are so-called 'chronic procrastinators'. This is mostly caused by different conditions of neurodiversity, for example the spectrum of autism and ADHD. Although chronic procrastinators do get their things done, there are also downsides to long-term postponing habits. Risking being late to deadlines raises the cortisol levels in the human body. Just like with chronic stress, constant high levels of stress hormones can start damaging the reaction systems and balance in brain chemistry. Therefore, however sometimes inevitable, constant procrastination is not ideal and unsustainable for one's body. But don't worry, this is only the case in about 15-20% adults, there is a much bigger chance you just occasionally procrastinate.

Temporary procrastination can be divided into subcategories based on the 'reason' why it's done.

The term



'thrill-seeking' is used when the motivation for the brain behind postponing the task is to get the excitement of almost being late, or just basically getting high on stress hormones.

Procrastinators are called indecisive when they want to escape the blame for a subpar result in their task. Further, avoiding procrastinators skip doing the task to dodge the judgement for (un)successful performance. However, these reasonings are not conscious, more intuitive, motivating you to procrastinate due to aforementioned reasons.

Now, the next time you are procrastinating, do a little self-reflection, think about why you might be avoiding the task. Just seeking the adrenaline or scared to fail? Or, maybe, there are just better things to do... for example to read this Lifeline.

procrastination is associated with bad habits: laziness, lack of ability, poor time-management or indifference. However, in reality it is just brain chemistry; certain hormones manipulate the activity of our brain regions, leading us to postpone our tasks. The prefrontal cortex is the decision-making centre of our brain, whereas the limbic system contains the pleasure centre. Naturally, when in the hormonal fight the limbic system wins, so does procrastination, leading to 'bettering' or 'simplifying' the current moment. So no, you are not chronically lazy or a dysfunctional human being, sometimes our brains just play us a prank. Or more simply put...me want more good now!



# WHEN IT'S TIME TO GO

YOU BETTER HAVE A PLAN

By Eva Dine Lemson



The nights are long, the days are cold and your mind might not be as bright as usually. So what could be a better time to discuss humanity's favorite subject: death. Or more importantly, what will happen to your decomposing corpse :)

We often think of that as a conversation to be had far in our future, when we are looking at retirement homes and start to go on senior vacations. However, without sounding too cynical; death almost always comes unexpected. With our general distaste of thinking about, or worse, planning our death, you might never have thought of it. But there might not be that much of a reason to avoid the conversation. It might even be very fascinating to indulge with. So today, I will be your guide to death.

When we think of what will happen to our body after passing, we might think of the two most common options; a burial or a cremation. However, there are plenty of options that are not only more sustainable, but also worth considering. But first, the aforementioned elephant in the room; sustainability. While in the Netherlands it is no longer allowed (except for the royal family and a few other exceptions), embalming is still a very common way to preserve a body in a lot of countries, like the US for example. In the embalming procedure, chemicals are pumped into a body to keep it longer preserved. When one is buried, these chemicals get into the soil of a cemetery and have a real environmental impact on nature. Besides, even if you are not embalmed, a casket or coffin is rarely made to be decomposed. So when you are 'given back to the earth', that rarely actually happens. Cremation has, like most things involving burning, a massive CO<sub>2</sub> emission. One cremation on average is equivalent to 140 showers (!).

*So, what are the other options?*

A lot of our ancestors give us a good example of what a green burial could look like. In the Netherlands, and many other places around the world, you can have a so-called 'natural burial', where you, for example, get buried in an actual forest in a woven casket. In that case, one can decompose properly. However, a downside

of this method is that often you are not allowed to place a headstone or any other marker near the grave. So instead, you get a GPS code.

If you are not as attached to the idea of a classical burial, there are a few places in the world where one can be decomposed in a facility to then be turned into a soil your next of kin can use in their garden.

On the topic of cremations, there is actually a very promising alternative to cremation (cre meaning fire) is aquamation. In this process, your body will go through a speed-run of decomposing thanks to a mix of water and potassium hydroxide. Afterwards, only your bones remain which can be crushed to an indistinguishable substance to cremated remains. So the same result, without as much of the emission.

Lastly, I will offer an option that isn't for the fainthearted. Even though I think the idea of becoming food for plants isn't that far from your imagination, you can also go a different route. In certain countries, a traditional sky burial is legal. In a sky burial, a corpse is directly offered to vultures, skipping a lot of steps in the food chain. Still, that might never become legal. Luckily for you, there is research being done on turning corpses into food bricks for wildlife. Though that is still a distant future and almost no further information about it is known.

In conclusion: your (maybe nonexistent) plans for death might not have to change that much to still be sustainable.





# TIERLIST

A tierlist is used to rank something from best to worst. Since the theme of this edition is time, the LifeLine has ranked the months of the year\*.



S

JULY

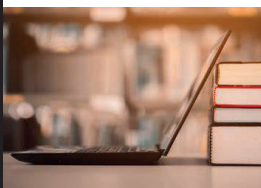


A

AUGUSTUS



SEPTEMBER



B

APRIL



MAY



DECEMBER\*\*



C

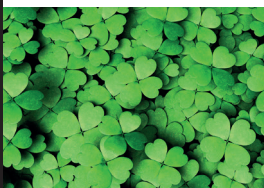
OCTOBER



**BONUS** OUR FAVOURITE SEASON

D

MARCH



WINTER

SUMMER

SPRING

AUTUMN

E

JANUARY



NOVEMBER



F

FEBRUARY



\* June has been excluded due to too many different opinions  
\*\* because of oliebollen



# TO AGE OR NOT TO AGE?

## EVOLUTIONARY THEORY OF AGEING

By Ella Rees-Baylis



**That is not the question. Because you definitely will age. In fact, almost all multicellular organisms on earth age. But why?**

Early in life which are actively selected for, but that these same alleles are harmful later in Ageing, or senescence, is the decrease in function as an organism gets older. For example, conditions and diseases such as macular degeneration, dementia, and diabetes are all much more common in older people compared to younger people. Ageing is in fact an almost universal feature of all multicellular organisms. However, despite its commonality, the underlying evolution of senescence is still a topic of debate. Under Darwin's theory of natural selection, we typically expect traits that negatively impact an organism (i.e., decrease its survival and/or reproduction) to be purged from the population. So how is it that such harmful traits that emerge later in life are allowed to persist? Why has something as seemingly unfavourable as senescence evolved?

To answer this question, the first thing we must realise is that the strength of natural selection does not stay equal throughout an organism's entire life. For most animals, the world is a dangerous place full of predators, pathogens, competitors, and other hazards. Consequently, most individuals will have reproduced and then die before they even reach old age. In these individuals, mutations that are harmful later in life are in fact completely neutral during early life - the reproduction and/or survival of an individual cannot be harmed if it has already completed reproduction and has died. The force of selection is therefore strongest early in life when an individual is still reproducing, and subsequently declines with age. In this later life stage, there is a selection shadow where selection does not "see" most harmful mutations occur, and thus they are able to accumulate. For the individuals that are not living longer, this means they will develop the harmful conditions and diseases associated with ageing.

Humans are a great example of this idea. In the last few centuries, research significantly improved our medicine, healthcare, treatments, and prevention of diseases. Accordingly, the average human

lifespan steadily increased - in 1900, a European person lived for 43 years, on average, compared to around 80 years today. What does this mean for the evolution of ageing? The previous shorter lifespan of humans allows mutations with late-onset harmful effects to accumulate for thousands of years. Only now, our way longer lifespans reveal these negative impacts of ageing.

But how exactly do these mutations actually occur and prevail? Evolutionary biologists now tend to agree on two main explanations. The first is mutation accumulation - certain alleles have no effect on survival and/or reproduction earlier in life, and thus can accumulate neutrally via random genetic drift (i.e., there is no selection against them to get rid of them). However, the same mutations have harmful consequences later in life, likely after the individual has already reproduced. If the genes have already been passed on to the next generation, selection will be inefficient at removing these mutations from the population. An alternative explanation is the antagonistic pleiotropy theory. This theory's similar to mutation accumulation but instead posits that there can be beneficial mutations life. Again, the mutations have likely already been transferred to the next generation at this point, so the mutations are sitting in a selection shadow and are not removed. Therefore, both these evolutionary theories of senescence can explain how seemingly detrimental mutations in older people can persist.

In the end, ageing is inevitable. It's the outcome of thousands of years of evolution. So enjoy the time you have now, whilst natural selection is still mainly acting in your favour!





# THE TIMELINE OF LIFE

By Jelle de Jong



The timeline of life does not have a clear beginning or end. When pictured as a thread, the lifeline that is clear to us starts as a bit of a knot. This knot represents the transfer of genetic information between unicellular life forms. Somewhere in this knot we can find LUCA, the last universal common ancestor of all current life. Let's start at LUCA and follow the thread

towards the point representing the ancestor of all living humans. When following the thread, many splits can be found, most of them turning into dead ends. While the splits represent speciation events, the dead ends represent extinction events. Further on the thread we come across an entanglement. This represents the endosymbiosis of mitochondria in eukaryotes. If we were to follow the thread towards the current day plants we would find another entanglement point, which represents the endosymbiosis of chloroplasts into the eukaryote. Resuming our journey, it is hard not to notice that at certain points most of the lines abruptly end. After these points the surviving lines seem to split far more than usual. These points represent the mass extinctions and the speciation of the survivors into the niches left vacant by the dead ends.

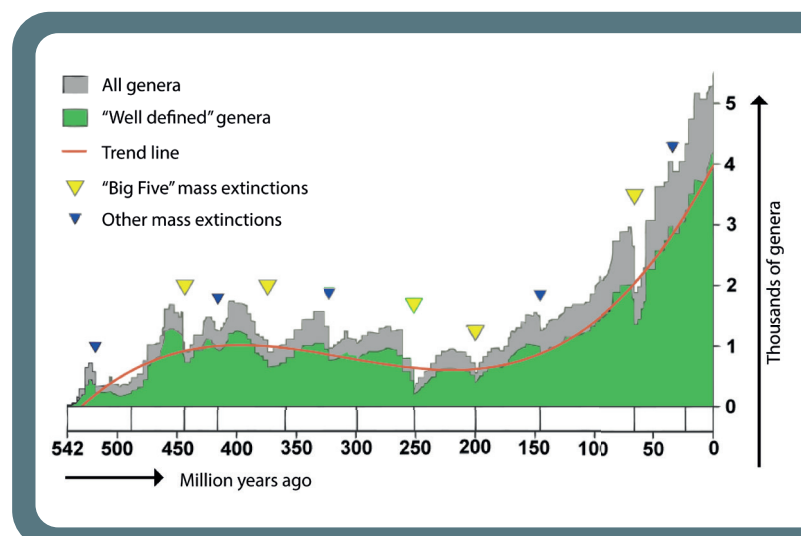
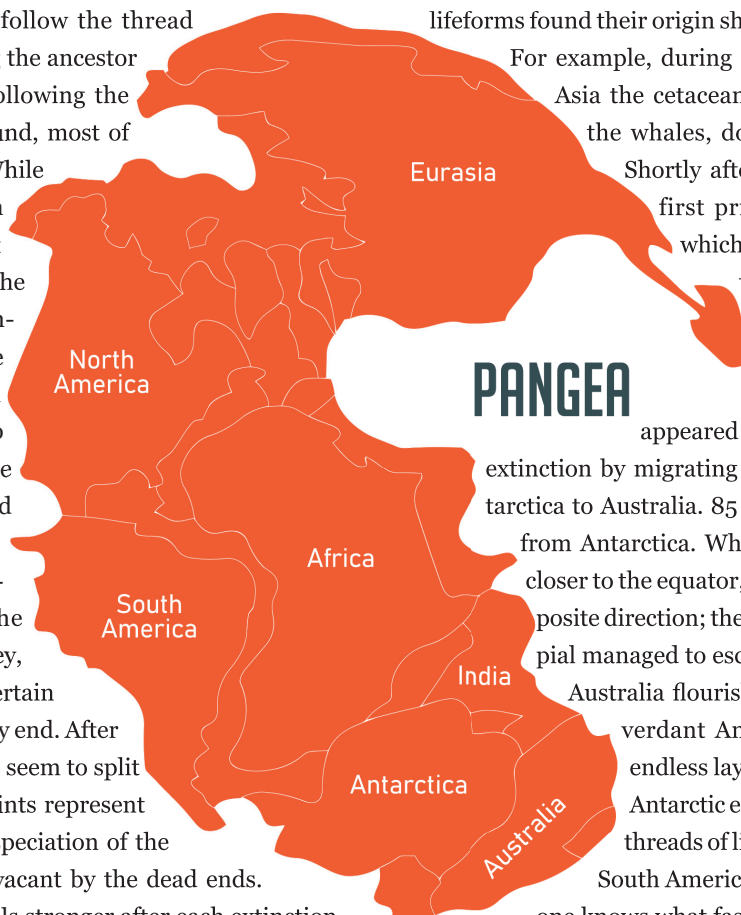
Weirdly enough, the thread feels stronger after each extinction event. After each diversification the lines seem less likely to end and more likely to make it through further mass extinctions. Finally, we reach the point at which we find the last ancestor to all of humanity. After this point we can see the growing end of all remaining lines. It has to be noted though, this end, the longest ongoing bundle of threads, seems to thin out near the growing end; the current mass extinction. The latest mass extinction happened not that long after Pangea, the most recent supercontinent, split. Most of our mammalian friends have origins that predate this extinction event. Pangea was home to the ancestors of all current terrestrial life. How did life get from one supercontinent to the current varied biogeographical realms of today?

Roughly put, the Tethys sea split Pangea horizontally into Laurasia (arctic) and Gondwana (tropic). The arctic adapted to the cold, favouring pine trees and warm-bloods while the tropic supported a more varied collection of species. The Atlantic ocean split the world again, this time vertically. In the Arctic, Europe

(Palearctic) was split from North America (Nearctic). Likewise, the tropic realm split into Africa (Afrotropic) and South America (Neotropic) as well as India, Australia and Antarctica. When the tectonic plate containing India smashed into Asia, the Himalayas arose, disconnecting Indomalaya from the rest of Eurasia. Many lifeforms found their origin shortly after Pangea shattered.

For example, during India's isolated voyage into Asia the cetaceans evolved, better known as the whales, dolphins and orcas of today.

Shortly after Gondwana shattered, the first primates appeared in Africa, which were only able to spread to the recently disconnected South America and India, where they can be found today. The first marsupials appeared in North America, escaping extinction by migrating via South America and Antarctica to Australia. 85 mya Australia disconnected from Antarctica. While Australia found its place closer to the equator, Antarctica drifted in the opposite direction; the south pole. Only one marsupial managed to escape Antarctica. While life in Australia flourished, the surface of the once verdant Antarctica got covered under endless layers of snowfall, dooming the Antarctic ecosystem. While it is clear the threads of life that connect Australia and South America run through Antarctica, no one knows what fascinating long gone lifeforms now lay hidden beneath the giant white blanket. With time, more dead ends will be discovered, helping to unravel the mysteries and unclaritys regarding the timeline of life.





# REVIEWING... ALARM TONES... REVIEWING

7.30 AM. Your room is pitch-black because it's freaking winter and the sun is still sleeping. Your suprachiasmatic nucleus thinks you should also still be sleeping, but the university disagrees. Education > sleep, right? Most students use an alarm clock to fight nature and still wake up at an ungodly hour. Luckily, there are numerous alarm clocks and everyone prefers something different, but which one is deemed the absolute best? Lifeline took one for the team and reviewed the alarm clocks of their members, which included a wide variety of sounds! Hurry up and read along so your mornings will be heavenly.



We attentively listened to each sound and graded each alarm noise on its pleasantness, wakeability, roommate-friendliness, catchiness, and buildup, from 1-10. 1 is the lowest/worst and 10 is the highest/best, you know the drill.

First off, the alarm clock of yours truly. The first thing I hear when I wake up? Crickets (more likely, cicadas, as Ella cleverly noticed). Lifeline members were not huge fans of the crickets, leading to a pleasantness score of only 4.5. Marit (me): "You get conditioned and cannot unhear cricket sounds in movies anymore, so beware. Also, the cricket practical was hell." The sound is roommate friendly though, but the majority doubts whether this will wake them up. Not very catchy, nor is there buildup, but a pretty decent alarm clock nonetheless.

Then Lisanne, who has developed an ingenious strategy to wake up using 3 (!) different alarm clocks so she knows how much time has passed since snoozing. For practical reasons, we only reviewed her first alarm which serves the function of waking her slowly up. The bird sounds were rated as very pleasant by the Lifeliners, also for your roommates, and the buildup was amazing (the volume slowly increases). It isn't very catchy though, but hey, a small price to pay.

Next up is Ella's alarm clock. If we could review her suprachiasmatic nucleus we would have, as she doesn't normally use her phone alarm clock! Still, we reviewed the one she "has used at least one time." Cecile: "It's kinda like a waiting room song?". Marit: "Weirdly resembles the Mii song on the Nintendo Wii". The sound is super catchy but not the most roommate-friendly unless they enjoy an upbeat Mii dancing session in the early mornings. You would wake up from this though, but most of Lifeline would be pretty annoyed, despite the high grade on catchiness.

Moving on we have our lovely chair, Anette. She likes to wake up with a very mystical vibe. Cecile: "Ting tong". Lisanne and Marit admire the catchiness of the sound, but most members agree that the buildup is not really there. Will we wake up from it though? Probably, but for the heaviest of sleepers, this alarm might not do the trick. Pretty roommate-friendly as well, as long as you don't let it ring for tooooooo long ;)

We arrived at our seccie's alarm (Cecile's). What the actual fuck is this. Lisanne: "It's like you're in a horror movie and a super creepy clown comes?!". The sound created some polarization in our committee, as some of us loved the sound, but others couldn't stand it. They slightly agree that this isn't the most roommate-friendly one among all these sounds though, especially when you let it be for a few seconds. Kinda catchy though (if you're Pennywise ed.). We promise you that you will wake up from this though!

“IT'S LIKE YOU'RE IN A HORROR MOVIE AND A CREEPY CLOWN COMES?!”

Next up, Alessia's alarm. This newbie likes to wake up to fairy sounds every morning. Again, some polarization occurred: while the sound was pleasant and a nice brain scratch for some, others couldn't stand it ("It hurts my brain!"). Most of us would wake up to the alarm, but Eva still has her doubts. Your roommates will definitely not hate you when this goes off at 7 AM, but don't expect them to dance to

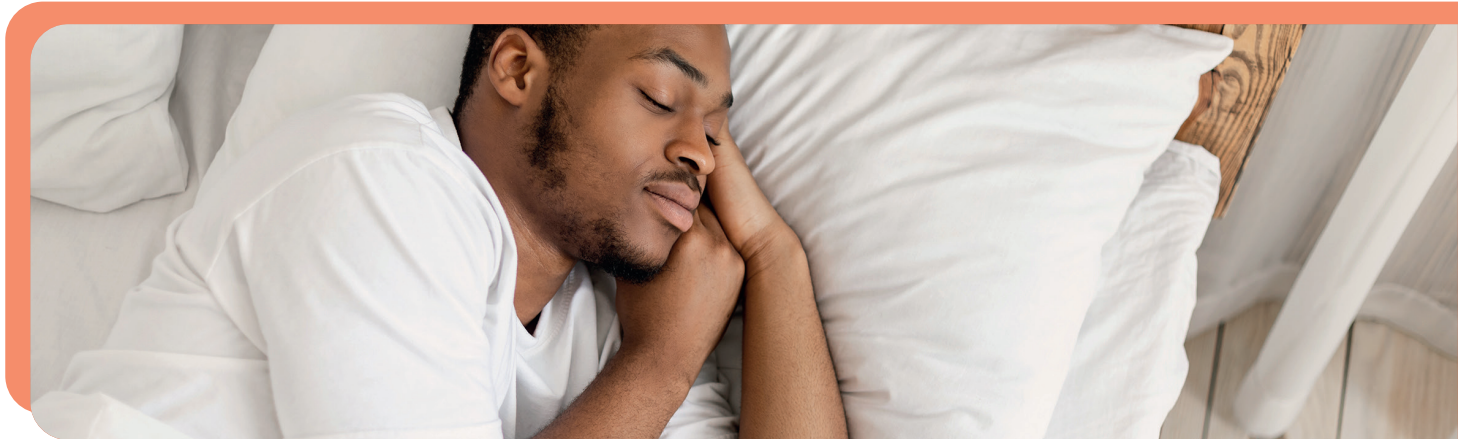


# YOU SNOOZE YOU LOSE...

By Marit Bonne



this sound, as it lacks some catchiness. Amazing buildup though, and if it doesn't hurt your brain, Lifeline highly recommends it.



Moving on, we have Michelle's alarm. You will most definitely wake up from this, partially due to the amazing buildup. It's catchy though, but most Lifeliners agree it's also not that pleasant, thus your roommates won't be too happy with this alarm.

Then Eva's alarm. She likes to wake up to this weird-ass pop song (just kidding, nothing but love for Eva). Although she swears by it, some Lifeliners doubt its pleasantness. All agree that we would definitely wake up from this catchy sound. If you and your roommate like to dance, it's roommate-friendly as well!!



Last but not least, Jelle's alarm. No sound this time, but this Lifeliner has a much more ingenious alarm clock: a daylight lamp. On his phone, Jelle sets his alarm and around half an hour before this time, his lightbulb in his room will slowly brighten to naturally wake him up. Less drowsiness and less scariness caused by pop songs or creepy clown music in the morning! Thus, buildup is high, but the alarm clock is not very catchy. It's super roommate-friendly though and also (according to Jelle) very pleasant to wake up to. Win win win!

How one would like to wake up in the early hours of the day is of course very personal. However, Lifeline highly recommends trying out the daylight lamp alarm from Jelle. A quick google will do the trick and it's also not too expensive!! If you'd rather have some auditory cues to rise and shine, Lisanne's alarm clock was on average deemed the most pleasant. So pick your favourite way of waking up and hopefully Lifeline makes your mornings a little bit easier.

“  
IT REALLY HURTS  
MY BRAIN !





# BAS EN Z'N BEESTJES

BEASTS BY BAS

By Bas van Boekholt

While I try to surprise you with every edition, after 34 articles even I show some patterns. When I don't have inspiration there is always one type of animal I can fall back on: eusocial insects. Something about their social organization pushed evolution to its limits. After the tantalizing termites and amazing ants Bas en zijn beestjes will introduce you to perhaps the most famous eusocial insect. So, let's see what all the buzz is about and dive into the bizarre behaviours of the bee.

Bees are part of the clade of the Anthopila and there are over 16.000 recognized species. They are fast flyers and beat their wings roughly 200 times per second. All to get you your honey. They work hard to be the only insect that makes us food we can eat. For one kilogram of honey they collectively fly about three times around the world, which takes them just over 3 trillion wingbeats (A calculation I was not expecting to make today). This busy flying also leads to an increased metabolism making a bee with a full stomach always about 40 minutes away from starvation. While most bees form their own hive, ranging from just about 50 to over 80,000 individuals, the cuckoo bumblebees have another plan. They are brood parasites and specialize in invading other bumblebee nests, killing the local queen and then subduing the works to focus their efforts on feeding them and their offspring. To help these raiders evolution gave them larger mandibles and venom sacs.

Next to these impressive physical feats, bees have some intelligent cognition as well. They have a complicated communication system where they use appropriately named "waggle-dances" to tell other bees about the location of food. With this one figure-eight shape dance they can signal the direction, distance and importance of the food source. But the main reason for this article is to share with you how we found out that bees are able to perceive time. Early researchers already figured out bees are able to predict when flowers bloom so they must have some type of time perception but the circadian rhythm had not been discovered yet so details were vague. Then came Ingeborg Beling who invented the following simple experiment. Every day at 4PM she would put out sugar water near the beehive and soon bees came out at that time even if there was no sugar water. While amazed, most researchers believed bees were measuring the angle of the sun and did not really measure time. So, she repeated the experiment but this time at night, same result. Now people told her it was some other solar radiation they went after not time. So, she moved the entire experiment into a massive salt mine removing any influence of the sun. Again, same result. But even then some people told her the bees were measuring the rotation of the earth instead of acknowledging bees are able perceive time.

Which, in my opinion, would be way more impressive. 30 years later Max Renner finally gave the concluding evidence by adding one change to the experiment. He trained the bees in Paris and when they were trained flew them overnight to New York. And then, the bees left the hive at ... 10 am. Cause the bees had jetlag.

Nowadays, we figured some more impressive feats that these little buzzboys are able to do. They are able to socially learn complex tasks by observing fellow bees. The latest task was grabbing a small wooden ball and pushing it around to score a "goal" (seriously, google this, there is an interesting video of this). Bumblebees are able to count and do sums from 1 to 5 objects. And they even understand the concept of "0" being less than 1. A feat that apart from apes only has been shown in dolphins. In addition, we share the cognitive habit of putting numbers on an imaginary number line from left to right. Which actually we don't share with Arabic people who have a scripture that writes from right to left.

One golden rule that I adhere to in my research field is that if a behaviour in an animal looks the same, is promoted by the same factors and shows similar results, it probably has a shared evolutionary origin. While this might sound perfectly logical to you, there are a lot of people who struggle with this. Time and time again, researchers came up with the weirdest explanation about why a similar behaviour in animals can absolutely not be the same as we humans show (like measuring earth's rotation from the bottom of a salt mine). With Bas en zijn Beestjes I have always tried to show how amazing animals are and how we humans are nothing more than one species in a sea of millions. While, in first instance, it might look that bees have nothing in common with us there is more than meets the eye (or eyes as this animal has 5 of them). I hope next time you encounter one you know you can show him your watch and he might perform a little dance to point you to nectar. One last tip: if you are allergic to bees follow the advice from ancient Egyptian King Pepi II. Cover a slave completely with honey and let him walk a few meters away from you. No bee will bother you.







**one day a generation  
will come that will call  
our memes cringe**

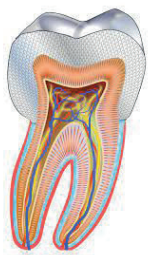


**Until we meet again.**



# THE IDUZZLE

YOUR FAVOURITE PUZZLE



-too

+



-e



-ien

+



-nor, +s



p=s



l=t



c=ch

+

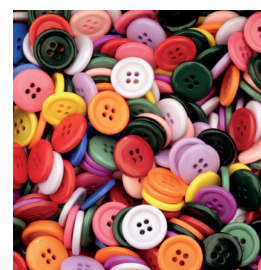


l=g, -bian



rd=ngs

,



-tons

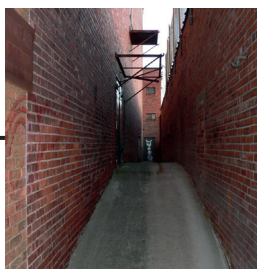


ga=u



n=c, +u

+



-e



r=v

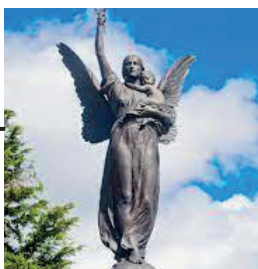


-e



-air

+



-l



i=h, +m



fl=y

+



b=s, t=f

The previous Iduzzle was won by **Hanne Lise Doosje** 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](mailto:redactie@idun.nl) before 21<sup>th</sup> of March

Answer to iduzzle 69: Some things are nice, some are nicer, some are even worth writing about.