

Lifeline

Tiny Things

GLV Idun

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PREFACE

Dear reader,

Almost half a year has elapsed from the time I wrote my first preface to the moment you are reading this. So disorientating, isn't it? That's the burden of time. But I have a feeling that this year will be an improvement on the previous one. And along with all of the other improvements that I expect will follow, this new year comes with a new Lifeline, and a new Lifeline comes with new distractions. To once again help avert your eyes from the weight of life's realities, we present this edition's theme: 'Tiny Things.' In my experience, nothing distracts better than the small. And as a person whom many of you would consider a tiny thing, I guess it's rather fitting that I be the one to present it. In this edition, we provide information on our favorite tiny animals, advise you on origami, and feature your Idun house-plant submissions in our picture pages. I hope you enjoy our educationally thrilling content.

Hugs and kisses,

Dana Frank

Lifeline editor in chief 2020-2021



Dear reader,

I'm so glad I can say some words to you in this way, since I can't see or talk to you all at events such as Idunights, like I had hoped. I think we are all suffering from the current situation in some way, some more than others, but Idun will be here for you in these hard times! That's why I hope you are happy to find this Lifeline edition in your inbox or somewhere at the university. It gives us all an anchor to the association we like so much and to our fellow members who go through the same struggles.

Alright, enough of this sentimental talk. Now it's time for fun or interesting articles around the theme 'Tiny'. I'm wondering if the articles will be tiny, or maybe the letters? Are we going to look at tiny humans or tiny bacteria? Tiny plants or tiny molecules? Is something tiny by definition or only in comparison to something else?

A lot of questions, so there's only one thing left to do: read the Lifeline!

On behalf of the fifteenth board,

Aliek Hasperhoven

Chairman of GLV Idun 2020-2021

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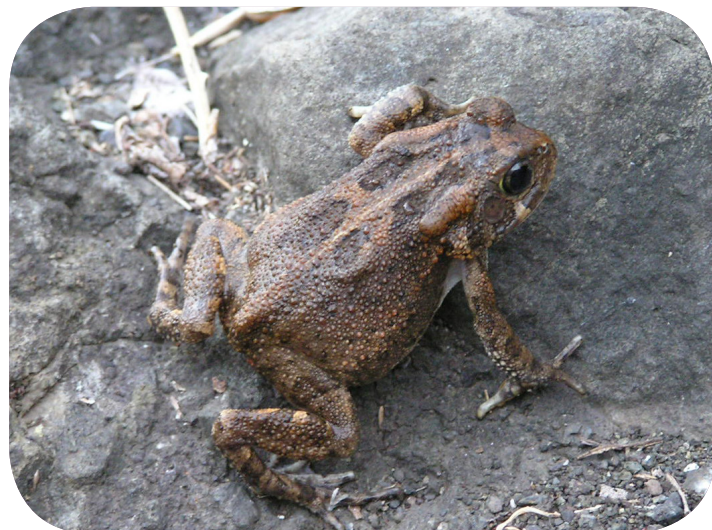
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SCIENTIFIC NEWS



RAPID EVOLUTION: TOAD BECOMES TINY

BY JUULTJE EENINK

Biologists monitoring and researching two invasive toad species on the islands of Mauritius and Réunion have reported that both species became significantly smaller in the course of the last one hundred years. It is known that such processes of evolution take place, but these normally take millions of years. About one hundred years ago, in 1922, scientists placed the guttural toads (*Sclerophrys gutturalis*) on these islands to investigate phenotypic change, including change in body size. Island ecosystems have traditionally always been natural laboratories for this, and dwarfism is often an adaptation to a smaller living environment such as found on an island. However, the change in size that was seen in these toads, that were originally from the mainland of Africa, is exceptional because of the rate at which it occurred. The female toads on both the islands were significantly smaller, on Mauritius they reduced by 33.9% and on Réunion by 25.9%, the males on Mauritius also reduced by 22.4%. The hindlimb length on both the islands also significantly reduced in both sexes, ranging from 3.4 to 9.0%. The researchers cannot say definitive what the cause of these exceptionally quick adaptations were, but they suggest that the reduction of the hindlimbs might be caused by the lack of natural enemies and lessened need to flee those.



PERRY THE PLATYPUS AND HIS 10 SEX CHROMOSOMES

BY MEISKE PIETERS

The platypus and echidna are the only two egg-laying mammals, or monotremes, still in existence. Therefore, they are a very interesting subject to give insight into mammalian evolution. Both animals possess a very bizarre combination of traits, just take a look at their bodies. Not only that, but they also share similarities to birds, like having a cloaca. You could have guessed that by their very fitting name, monotremes, or in other words single holed. The genomes of these single holed animals have been studied, including their 10 sex chromosomes (yes 10!). Researchers recently published new evidence in *Nature*, suggesting that the sex chromosome complex of the monotremes originated from an ancestral ring configuration. The ring then broke apart into fragments during further evolution and these fragments.



WHAT LONELINESS LOOKS LIKE IN THE HUMAN BRAIN

BY MARIT BONNE

These pandemic times, which are often lonely, are not great for one's mental health. That being said, the effects of persistent loneliness cause alterations of the brain, especially in the default network. Researchers at McGill University compared 40,000 MRI scans, comparing scans of self-reported lonely people against MRI scans of people who did not experience lonely feelings. Differences were seen in the default network of the brain, an area used for things as future planning, reminiscing and thinking about others. Surprisingly, in the individuals that experienced loneliness often, the amount of gray matter was increased and there were overall stronger connections. This enhanced activity can be explained by the frequency in which lonely people are expected to reminisce past social events, imagining the future and thinking about a hypothetical present. Lonely people tend to be more internally focused, which is why the default network might be linked strongly. Loneliness in the elderly, but also in students, is very common. Therefore, recognizing and understanding more about the impact it has on the health of humans, both mentally and physically, could lead to better treatment and fuel interesting research.



The gray *Fritillaria delavayi* (c) Y. Niu, *ScienceNews*

PLANT CAMOUFLAGE TO AVOID PEOPLE

BY DANA FRANK

Fritillaria have long served medicinal purposes used by traditional Chinese herbalists. Typically a bright green plant, it grows in the Himalayan and Hengduan mountain ranges where against the stone-based background, it is easily visible by those who are interested in harvesting its bulbs. This is convenient because demand for the powder of dried, ground *Fritillaria* bulbs is high; for 2000 years it has been a most popular cough-medicine in southwest China.

It was recently discovered however that *Fritillaria* has developed a strain of more camouflaged appearance, in response to humans picking them (which they seem to dislike for understandable reasons). The green part of the plant has evolved to naturally retain the color of the rocks upon which they grow. Also, it was found that *Fritillaria delavayi* growing in areas where people pick them most, are the ones most camouflaged.

This is a fascinating example of human driven change considering the implications for the plant. By taking on a greyish, brownish color, the plant places many hurdles before it. After all, bright colors serve a purpose, namely to attract pollinators and promote photosynthesis. But despite these risks, the dull color adaptation still holds, demonstrating how significantly humans can influence a group of lowly little flowers.

IN DUST WE TRUST

By Marit Bonne

It has been said that something as small as the flutter of a butterfly's wing can ultimately cause a typhoon halfway around the world. The wings of a butterfly flutter all the time, mostly without us noticing. This, however, does not mean that this fluttering is insignificant to us humans. Surprisingly, the same thing holds for dust; a rather tiny particle that has a great impact on the world as we know it. Moreover, recent studies focusing on dust provide us with interesting results that are anything but dusty.

Dust has a boring, annoying, and dirty reputation; but researchers like Jan-Berend Stuut might argue otherwise. He and his colleagues dedicated their research at NIOZ (Royal Netherlands Institute for Sea Research) to desert dust. Every year, approximately two billion tons (= about two billion giraffes) of Sahara dust are transported across the Atlantic ocean. These so-called transatlantic fluxes can be seen on satellite images and produce impressive pictures of countless dust particles being carried away by the wind. As intriguing as these images may seem, they are not the main interest of the studies performed on dust. On its journey, dust influences the climate and the atmosphere of the earth, both directly and indirectly.

Desert dust is not just sand, it is packed full of nutrients. This means it can act as a fertilizer, promoting algae growth along its path. Increased algae growth enhances carbon dioxide uptake from the air, indirectly. When the algae die, they take the captured carbon with them to the bottom of the ocean, which potentially counterbalances the high carbon emissions humans produce nowadays. Next to nutrients that favor marine plant life, dust can also carry nasty microbes and spores with them. The spread of these pathogens influences ocean systems negatively. The black-band disease, for example, which can be found in Caribbean corals, is related to transport via the wind. Dust is a great conveyance for microbes, as they use clay particles to protect themselves from UV-radiation.

'A warm blanket', is how Jan-Berend describes the effect of Sahara dust that is present in the lower atmosphere. Here the tiny particles have an insulating, greenhouse-gas like, effect that could possibly contribute to global warming. Instead of retaining heat, dust higher in the atmosphere helps to cool down our planet a bit. Particles here are able to reflect the heat of the sun, partially protecting the earth from the sun's energy. How



fascinating the big role that dust plays in the global climate is! Not only that, but dust can also tell us about the past. It is like a fingerprint that tells us chemically where it came from and what its original environment looked like. This unique composition of dust helps to study dust dispersal in the geologic past and can even reconstruct past environmental conditions of dust-sources, using sediments from the ocean floor.

Overall, dust can be almost poetic. Tiny particles that greatly influence our climate, because they come in great quantities. It is a form of transport, a fertilizer, and protection, but also a suffocating isolation and stubborn disease-spreader. It can be the problem as well as the solution. Dust tells us a story about how certain places looked before you were born; in such a way that it keeps you fascinated. And thus, research on dust is not boring or insignificant, just like dust itself.

Want to know more about the interesting research about dust? Check out: <https://www.nioz.nl/en/about/ocs/dust> and <https://www.nioz.nl/en/about/organisation/staff/jan-berend-stuut> for more information. For dust-related blogs, take a look at <https://www.nioz.nl/en/blog/topic/1355> and <http://www.stuut.tv/> <https://www.netflix.com/title/81031737> and the episode 'dust' also is worth watching!



THE TINIEST DINOSAUR

By Renate Kloostra

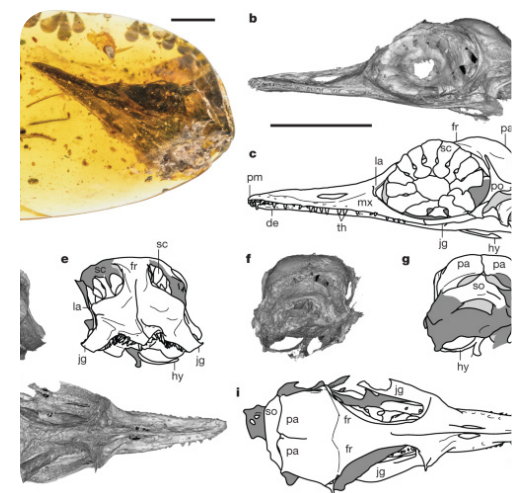


Usually, when we think of dinosaurs we think of these gigantic, monstrous beasts. But that isn't always the case. Even though most of the famous dinosaurs are big boys, there are also some really cool underappreciated smaller dinosaurs. In this article, we're going to talk about one of those. I want you all to meet the Oculudentavis.

Last March, an Oculudentavis skull was discovered for the first time in a piece of amber. The skull measures about 1.5 centimeters long from the back of the head to the tip of the snout, and it has the width of a human thumbnail, making it the smallest dinosaur ever to be found. The scientists thought that this skull was probably the remains of a bird-like species with lizard-like eyes. However, later this year, in August, another Oculudentavis fossil was found, which consisted of other body parts as well, and not just the head. With this new fossil, scientists could conclude that this new dinosaur was actually a weird looking lizard and not a bird. Susan Evans, a paleontologist who wrote about the new found said: "You've got this weird, big-eyed, kind of crested-nose thing that certainly doesn't at first look like a lizard" and then she added: "It's weird, but it's a lizard."

This means that this "smallest dinosaur ever", is in fact not a dinosaur. It's a lizard. But it's an amazing one.

The name Oculudentavis literally means, eye tooth bird. And even though it appears not to be a bird, scientists still decided to stick with the name it was originally given. It lived in the cretaceous period, which started about 145.5 million years ago. There is still a lot unknown about this cool creature, but there are some things that probably are true, such as the fact that it most likely fed on insects and lived in trees.



Mastering student cooking with Koen



Hello guys! I hope everyone is all right! It is winter and we all want to feel warm and cosy. For that reason, I will be sharing a recipe of mine that I use a lot when it is colder outside. Nothing better than having a nice soup ready. Also, feel free to experiment with this recipe. Enjoy!

My best,
Koen

Rosemary lentil Soup

When you are looking for a nice meal that fills your stomach nicely and does not break the bank, or if you are looking to prep a batch of food so you don't have to cook for a couple of days, then this lentil soup is great! As I already said earlier, the flavour is well suited for cold winter months. Packed full of proteins and vegetables, and very easy to make! All you need is a soup pan, sieve and a soup spoon! This recipe contains sausages, which are cooked with the soup if they are made of meat. Luckily and preferably, I use vegetarian sausages baked in a pan, which I add to the soup when it is done. Be careful not to cook your veggie sausage, they tend to inflate to 4x size after a while (yes that really happened).

Ingredients for two people:

300 g of brown lentils
1 large onion
1 leek
1 celery
500 g firm boiling potatoes
1 sprig of rosemary
(or a tablespoon of dried rosemary)
4 lean beef, vegetarian or
vegan sausages
1 clove of garlic
4 tablespoons of olive oil
2 herbal bouillon tablets
(sea) salt
pepper (freshly ground)

How to make:

Wash the lentils in a sieve and remove any stones. Peel and finely chop the onions. Clean the leek and ribbed celery and cut into thick rings. Peel and dice the potatoes. If you are using fresh rosemary, remove leaves from the twigs and chop them finely. Pierce sausages with a fork a few times to prevent them from bursting. If using vegetarian sausages, this is not necessary, since they are not cooked in the soup. Peel and slice garlic thinly. Heat 2 tablespoons of oil in (soup)pan and fry the onion and garlic gently for about 5 minutes. Add the leek, ribbed celery, diced potatoes, garlic, lentils, rosemary and sausages (bake the sausages in a baking pan if they are vegetarian/vegan until they are brown). Crumble the bouillon tablets in 1,25 liter of boiling water and add to the soup. Bring the soup back to the boil. Place the lid on the pan and let soup simmer on low heat for at least 30 minutes, until all ingredients are cooked. Remove sausages from the (baking) pan, cut into slices and add them to four soup bowls, or put them back in the soup. Add salt and pepper to taste and serve the soup in soup bowls. Enjoy your soup crammed full with proteins and flavour!

WHY WE LIKE TINY THINGS



By Juultje Eenink

A few years ago, my boyfriend made a long-cherished dream of mine come true: He took me to Madurodam. For me, this is a magical place where wishes come true. In reality, it is just a park full of miniature buildings that are most well known in the Netherlands - like the Euromast, the royal palace and Groningen's train station. I, however, had the time of my life and I still think about it on a regular basis, when I look at the tiny pair of wooden shoes that I got there. And I am not the only one attracted to tiny things, judging by the numerous miniature related trends, toys and serious(!) hobbies that exist. But why are we so obsessed with tiny things?

Maybe you are a little surprised by me saying a lot of people enjoy miniature things, because you think about model trains and tiny villages when the word miniature comes to mind. But chances are you yourself have at one point in your life enjoyed tiny things as well. Quite a few, now typical children's toys, are miniatures when you start thinking about it. Looking up "typical boy toys" gives you action figures, model cars and toy soldiers. Do the same for girls and you will find that a similar list does not exist, but ads of barbies and doll houses pop up. All of these are, in fact, miniatures.



But not just children enjoy miniatures as toys, adults do as well - be it not as toys. In fact, the first doll houses were not even meant for children. In the seventeenth century, the first dollhouses were made and became very popular in Germany and the Netherlands. They were, at the time, a symbol of wealth. You would not play with them; they were solely to display your expensive miniature items. Miniature items nowadays are still quite expensive, especially if you do not see its value because you cannot actually use the objects for anything. However, the miniatures are not nearly as expensive as the real full-sized objects they represent. Which some scientists claim is the reason of their popularity.

Miniatures offer an alternative life. Doll houses, barbies and even games like the Sims, give you an opportunity to create a

life that you would never be able to experience in full-size. Of course, this is the case for children, pretending to have their own home, but also for adults, who create lives full of opulence they could never afford. (motherlode)



Another factor that might play a role in this, is control. With the toy cars you hold in your hand, YOU decide where they are going. The barbies you played with, YOU decided whether she was marrying Ken - and how long the marriage lasted if a new malibu beach boy or girl came along. And the same holds for the miniatures we cannot call toys anymore, like model trains. For some people the enjoyment in these purely comes from the ability to control if the trains are on time and figuring out a railway system where those set times of arrival and departure are always met. I would want to urge the NS to take a look at those people and learn from them, but come to think about it those people are only dealing with the stage they set for themselves. They do not have to deal with real life errors and malfunctions - which are, you guessed it, out of your control.

According to Claude Levi-Strauss, an anthropologist, we derive satisfaction from miniature objects because we can see them and comprehend them in their entirety. That makes the objects less threatening according to him, which could be the reason miniature towns and toy soldiers are so popular. But it is more about the ability to control the entire situations, which gives miniatures the ability to make us feel like gods. This might seem a little bit of a stretch, but be honest, don't you know someone who put their Sims in the pool and then removed the pool stairs? Think about that.

Even though some of these explanations seem a little sad or even cruel, do not hold yourself back if you want to enjoy miniatures. You are only human after all. And, more reassuring, a lot of the enjoyment also comes from the fact that tiny things are often cuter, and you can see the craftsmanship that goes into these things. I mean, making a taco is quite impressive. But making a miniature taco? That is some serious craftsmanship right there! Or maybe that is just me - along with a few other enthusiasts... Join us, because for us, it will always be the little things in life that matter the most.

[TINY] MASTERS OF DISGUISE

PYGMY SEAHORSES



By Nadia van Eekelen

Marine life comes in millions of shapes and sizes, from microscopic plankton to giant blue whales. I'm a fan of all ocean creatures, but I managed to pick just one to write about today. It is the most adorable tiny being: from their snout to the tip of their tail, they're just as big as your fingernail. I'm talking about the pygmy seahorse, one of the smallest species of seahorses in the world.



Seahorses are one of my favourite animals. They are small marine fish in the genus Hippocampus, which comes from hippos, meaning horse, and kampos, meaning sea monster. The pygmy seahorse, however, looks nothing like a sea monster. With their short snouts, they look just like baby animals. Who can resist something as cute as that?

Pygmy seahorses are not just tiny seahorses; they are a distinct group of animals. There are two ways to distinguish them from regular-sized seahorses. One is that the pygmy seahorses have only one gill-opening, on the back of their head, while other seahorses have two gill-openings on each side of their head. The other is that the males brood their young in a pouch in their trunk, whereas other seahorses have a pouch located at the base of the tail.

At least eight species of pygmy seahorses were named, with the first one to be discovered by accident in 1969 when a Caledonian marine biologist, Georges Bargibant, was collecting sea fans. While examining the sea fans, which are corals consisting of colonies of polyps, in his laboratory, he noticed a pair of tiny seahorses. The body structure of the seahorses completely resembled their background, as they were covered with round, calcified bumps (tubercles) that looked just like the polyps. This species is

now named Bargibant's pygmy seahorse. All species can be found in Southeast Asia in the Coral Triangle area. Some live on soft corals, seagrasses and algae as well.

It is amazing how the different species of the pygmy seahorse adapt to their habitats. The moment they pop out of their father's brood pouch, the baby seahorses are a boring, brown colour. Once they find a coral to live on, they curl their prehensile tails around a

branch. After a few days, their bodies grow to the shape, colour, and texture of the surroundings. Therefore, pygmy seahorses can be found in many different vibrant and neon-like colours, usually yellow, orange, purple, or pink. Their survival is based on this camouflage alone. It is designed for them to live among the same coral their entire life. Once the seahorse leaves, it will not blend in with the background anymore and will likely be predated upon. It is unknown if they can change colour if they move to a new host with a different colour than their original host. Other species of seahorses do have this ability.

This is not the only thing unknown about these beautiful creatures. There are still a lot more questions to answer about the population, distribution, and potential threats the species are facing. Due to their small size and effective camouflage, they are often overlooked. This makes it difficult to research them. The IUCN (International Union for Conservation of Nature) therefore lists them as "data deficient".

It is suspected that there are many more species of pygmy seahorses to be discovered. Finding them is a challenge, but if you know where to look and are ready to play the game of hide-and-seek, you just might encounter one.

For all images:
Richard Smith - oceanrealmimages.com



MUSIC SECTION

TINY MAGICAL THINGS IN MUSIC



By Devi Seijkens

Oh boy, do I have something nice in store for you this time around. Usually in our music section, I put my undivided attention into one specific topic. But not this time. I'm going to take you through some of my favorite tiny moments that absolutely elevate the level of a song or performance.

John Mayer – Gravity (Live in LA 2009)



My first magical tidbit is from John Mayer's live album, on the song 'Gravity'. While the entire performance sets an absolutely magical ambient tone, the guitar solo at 6:24 amps it up a notch. Mayer uses a combination of harmonics, that produce only a high overtone, and string tree bending, where he actually increases tension on the string behind the nut. These components make for a sound that some people wouldn't even be able to tell was a guitar. By starting off the second guitar solo like this, he immediately grabs attention towards it, allowing him to really drive it home after.

Nothing But Thieves – Amsterdam

My third tidbit is from Nothing But Thieves' song 'Amsterdam'. A great song that features great moments throughout, but there's one specific part that stands out to me. After the bridge as they come back to the chorus, but where singer Conor Mason's voice usually rounds out all of the "over"s halfway through the chorus, here the last one becomes heavily distorted. Which really sets up the return of the instruments after, and overall just really gives the song a little more 'oomph' at the end.



Foo Fighters - Wheels

My fourth and final tidbit is from Foo Fighters. If you listen to the studio recording of 'Wheels', opposed to any live recording, there's a very distinct difference to it in the chorus. You see, probably by chance during one of their recording sessions for this song, one of their guitars produced feedback during the rest in the chorus. So while on live recordings you don't hear this feedback during the chorus, the recorded version does feature it. For me the song just doesn't hold up as much live, because of the lack of feedback in the chorus.

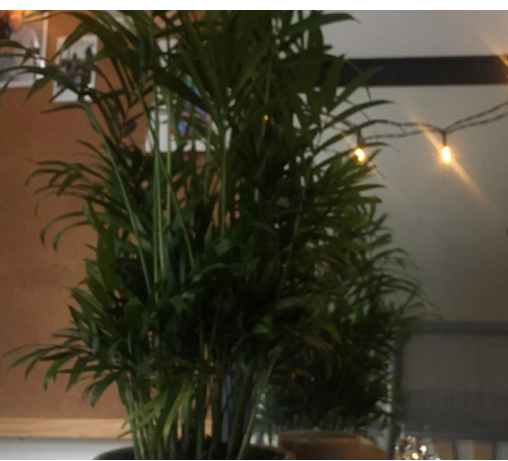


If you hadn't heard of some of the songs above, you would really do yourself a favor by checking them out. If you have heard of them, go listen again to see if you can recognize some of the things I mentioned. And if you already recognized them, then you should still listen to them, but you already know that they're awesome. Either way listening to these 4 recordings will provide you with 1.318 seconds of time well spent.

IMAGINE DRAGONS RADIOACTIVE

Imagine Dragons – Radioactive

The second tidbit is from Imagine Dragons' first hit single in the Netherlands, 'Radioactive'. This entire song I feel is quite catchy, but also very repetitive. The entire song is essentially the same throughout in terms of chord progressions and aside from the vocal bridge, most vocal melodies are similar as well. However, in the first verse, as the lyrics go: 'I'm breathing in the chemicals' a long inhale is followed by an exhale, 'OOOUUAAHH ahhh', while the rest of the music rests. I feel like this breaks up the monotony of the tune perfectly, which makes it less obvious and therefore elevated the song to the heights we know of now.



Lifeline



GLV Idun



"I'm gonna take a quick nap"
*8 hours later
Me confused af:



ROBOT TAKEOVER? YES, PLEASE!

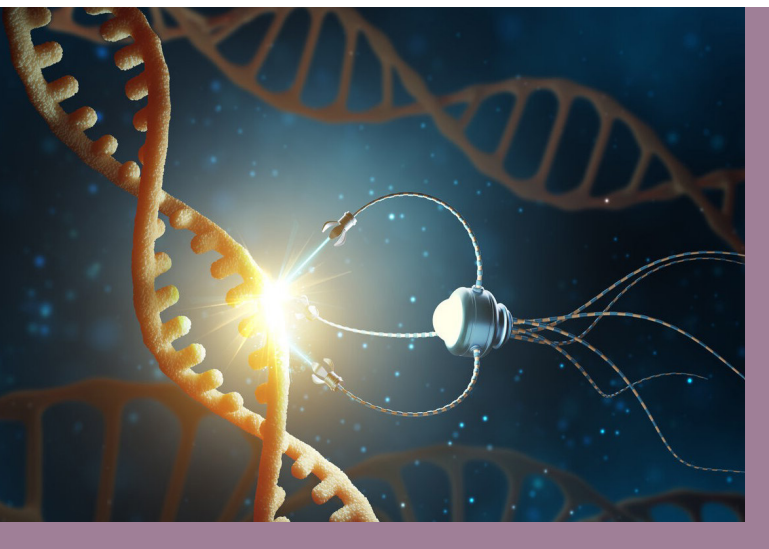
NANOROBOTS & FUTURE



By Anette Hallik

Imagine... an action scene with a hot actor who saves the world by using time machines, hoverboards, flying cars, and AI. Sounds familiar?

In the last few decades, every other blockbuster movie has been predicting utopic (or even dystopic) scientific breakthroughs for the future. Well, it is the future now. We have hovering cars, trains and boards, AI's get complicated year by year but most impressively, humans have mastered manipulating tiny technology. Nanotechnology.



Nanorobots are quite the movie stars: Star Trek, Terminator, and even the Marvel Universe, nanobots are featured quite frequently. What not to love about them - they are tiny, smart, and extremely sophisticated. But do they exist in our world today, and are they as amazing as we think?

Nanorobots, nanobots for friends, are like our everyday robots, only their parts are sized on the nanoscale. Cute, right? Besides cuteness, machines so small come in very handy in situations where human hands are way too big and clumsy to perform a delicate task. Inevitably, one of those fields in need of tiny workers is medicine. So far, medicine has treated many illnesses on 'the surface level' of bodies as reaching the source of problems is inaccessible. Is all of this about to change?

Fear of cholesterol has been planted in our heads from an early age, for a reason nevertheless. Excess cholesterol starts covering the walls of blood vessels, causing thrombosis and atherosclerosis that can even lead to myocardial infarction. Today, blood clots are fought against using medications to dissolve the clots or to widen the vessels themselves. These, unfortunately, are not the fastest methods, and atherosclerosis

still stands as a dangerous and unexpected disease. But fear not, nanotechnology has a solution for us! Tiny robot armies circling through our bloodstream, cleaning it from excess fat, and performing microsurgeries. Sounds crazy, however, possible. 200 nm long screw-shaped self-swimmers have been composed of iron oxide beads. Inspiration for a functional shape comes from the bacteria *Borrelia burgdorferi*, and the magnetic field moves metal microorganisms in our bloodstream. Even though this solution was invented five years ago, it is not yet widely used today because of the lack of human testing and high cost of such technology. As these robots reached human testing clinics last year, all hopes are high! Good luck, bots!

Nanobots small enough to swim through our blood vessels can do much more than just act as cleaners. The main focus in nanotechnology development right now is targeted medication. Targeted medication would mean injecting drugs in inaccessible locations in the human body, which would affect desired regions stronger and quicker, whilst being less invasive towards the rest of the body. These robots are moving due to either magnetics, light energy, acoustic or electric fields. Similarly to other nanotechnological applications, most experiments are still performed *in vitro*, though *in vivo* tests are expected in upcoming years.

A breakthrough in cancer treatment has been an important goal in medicine, there are already many new possibilities and medications, but the search has not ended. Nanobots have their role here as well. DNA nanorobots have the ability to bind to tumorous cells by recognizing certain proteins on the cancer cell membranes. After binding, the bots are opened, and they initiate coagulation inside the tumor cells. Sounds impressive in theory, but as things go, this method needs further research and testing before being released as a commercial cancer treatment. However, the success of DNA nanorobots has been proved on mice, so the breakthrough cannot be too far away.

Although we do live in the future, and the development of nanotechnology has given us smartphones, watches, and even smart clothes, the field has yet to be discovered. All of the mentioned medical applications would change the health care community unrecognizably, but some more time and effort need to be invested. There is still a long way to go, but a huge leap forward has already been taken. The exciting future with helper nanobots is ahead of us! Nanobots in our bloodstream, does that sound like a robot takeover? Indeed, but it doesn't sound so bad, right?

THE MYSTERY OF COMB JELLIES

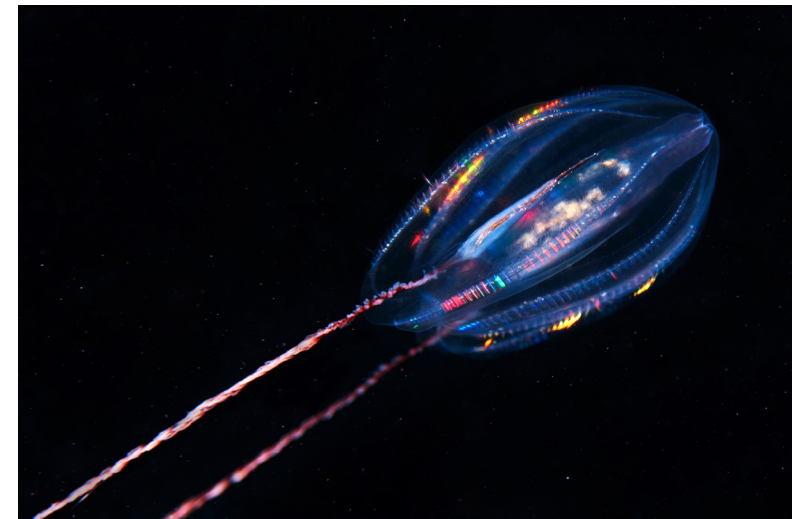


By Dana Frank

The comb jelly might be the most underrated gelatinous blob in aquatic existence. As small as they may seem, Ctenophora, as the phylum is called, are the largest of us metazoans to move through water with the help of cilia. Considering its talent in bioluminescence, participation in occasional cannibalism, and, in some species, defecation from a pore which is fused closed only to open when the need for waste expulsion arises, this animal is already quite impressive. Its scientific forte, though, lies outside these properties and within the realm of its mysterious relationship to the rest of the animal kingdom. It is, as I'm eager to inform you, unknown where our gelatinous friends belong on the tree of life.

The ctenophore mystery, as most phylogenetic puzzles do, starts with morphology. Before sequencing analysis was commonplace (unimaginably dark times those were), how an

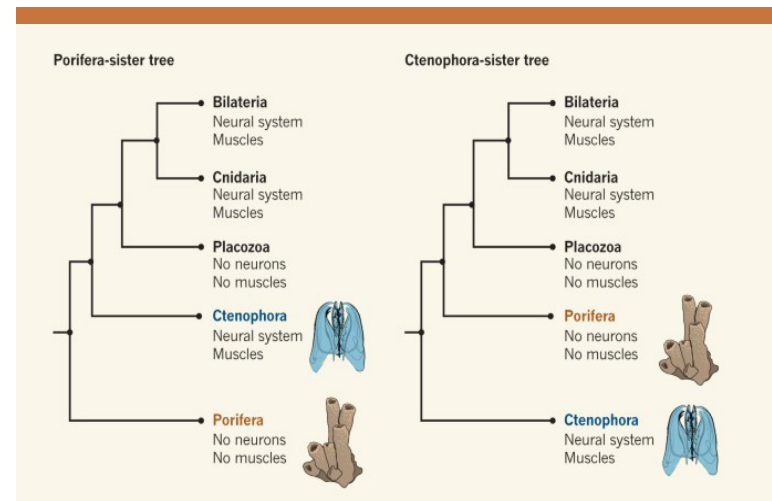
because of what I just described. On top of that, ctenophores were placed as a sister group to jellyfish primarily because they



looked similar. Even with our current knowledge, common sense can still cloud our judgment. How could it be different? Sponges are the simplest animals on earth. No nervous system, no internal organs to be found; they can barely even differentiate cells! How could it be that comb jellies, who possess a complex set of neurons and look uncannily akin to the equally gelatinous and cellularly complex jellyfish, possibly come first?

Dear reader, this is where I would like to introduce the puzzle of the convergent nervous system. Leonid Moroz was the first to second guess our dilemma. Upon realizing that the staining procedure for nerve cells, which we use for every other animal who possesses them, didn't work for ctenophores, he proposed something radical. This entire concept, as we know it, the intricate network of sensory cells, capable of computing and executing signals in a computer-like fashion, evolved twice.

An entire phylum of animals! Of which many species still exist and swim through the water which we share with them, put in the wrong place on the tree of life! Such nonsense people thought, and still, the controversy splits scientists like religious sects. The idea that comb jellies, not sponges, constitute the sister group to the rest of the metazoan lineage is a profound idea. But given that comb jellies are more related to sponges than jellies, it doesn't seem entirely implausible. The absence of neurotransmitters like serotonin and acetylcholine is more suggestive still. As of yet, our mystery remains unsolved. And until we find a better way to study those fragile floating jelly animals, that's how it will remain. But at least people are finally noticing them and giving them credit for their mystifying nature.



animal looked was the basis for its classification. If an animal was simple, it belonged at the bottom of the tree of life. If two animals looked similar, they were likely related. If they lived in the same part of the world, that was another indication of common ancestry. Often times, these clues do, in fact, lead us to the truth. But like all good mysteries, red herrings are put in place to confuse our initial impressions. We now know that complexity does not equal evolutionary progress; simple animals can evolve from complex animals and vice versa. We also know that animals can look alike, not just because they descend from a common ancestor, but because of evolutionary convergence. In order to outsmart nature's tricks, we have to consider more than superficial appearances.

Nevertheless, well beyond the primitive times preceding sequencing, sponges were placed at the bottom of the tree of life as the sister group to the rest of the animal lineage, precisely

TINY HOUSE, TINY IMPACT



By Roos Slijfer

It has become the trend of the century. People want to live freer with less stuff AND leave a smaller footprint on this beautiful planet we live on. I don't know about you, but I have watched a lot of TLC in these 'Corona' times, and there were a lot of tiny houses built on there. In the US it is already a big hit, but also in the Netherlands tiny houses are becoming more and more popular. For the people that don't know what tiny houses are, I will explain... A tiny house is a house that has a surface between 15 and 50 m². The idea arose when more living space became occupied but the family size was shrinking. People became more attached to materialistic things and needed the prestige of a big house. Other people, however, are not so keen on a materialistic way of living. Also, a big house is maybe not as good for the environment. The tiny houses on the other hand, are a big money saver and have a smaller impact on the environment.

Sarah Susanka, an English architect, was important for the start of the movement that is against the "bigger is better" mentality. In 1997 she published her book - The Not So Big House - A Blueprint For the Way We Really Live- when she was living in the US. Because more and more people became more aware that we have to do something for the environment, the tiny house movement spread to other countries as well. In Tokyo it became a solution for the lack of space, or a solution for the fact that it is just too crowded and there should be less people. But instead, they built smaller houses, so more people would fit in the city. Tiny houses also helped people in America that lost their home to hurricane Katrina and didn't have the money to buy or build a big house.

For the travellers among us, there are also tiny houses that are moveable. I think everyone thought at least once in their lives about travelling the world with a van. But you can also travel the world with your house! Also, I think I read something about not paying taxes in that situation. Which is kinda great.

I think most of us students think that they can live in a tiny house. We are used to our tiny rooms in student houses. Maybe with our fast-growing population, tiny houses will be needed. Maybe we would like to use tiny houses to be kinder to our earth. Or maybe you would like to be closer to your family by living in a smaller space. I for one can't think about living in a tiny house with two teenagers for example, but I have seen some people doing this.

I hope
you loved
this tiny
article
about tiny
houses!



PLEASE, DO TRY THIS AT HOME



By Prof. MD

Brighten up your cocktail with tiny things



EXPERIMENTS TO TRY AT HOME!
BETTER SAFE THAN SORRY, WEAR PROTECTIVE GEAR

I really like cocktails. I think if you don't like cocktails, you just didn't find your favourite cocktail yet. I also like the word cocktail because it is almost a Dutch grammar error. In the Netherlands, we have something called "dubbelop" (double up). Which is kind of the case with 'cocktail'. You have a 'cock' like 'penis' and a (male) tail, which also translates to penis. I am totally off-topic, but this is how my brain works. Sorry but not sorry.

Let's get back to the cocktail. I am going to give you an amazing medium, difficult cocktail to make: the martini espresso. Since most students like coffee and also do vodka shots in clubs, you guys might like this one a lot. I am more of a sambuca fan myself, but sambuca in this recipe will not do much good for it. So we will stick with the original recipe.

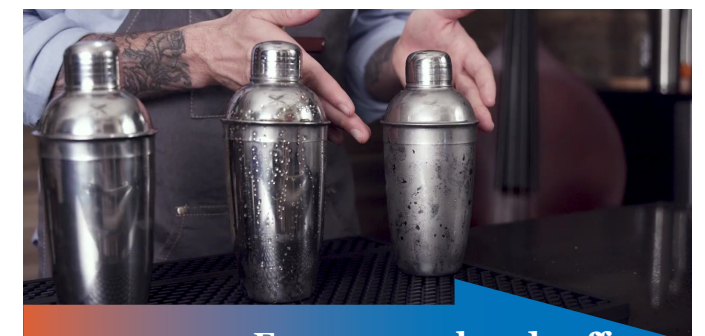
What do you need:

- A cocktail shaker (or a closed jar, a Mason Shaker, if you don't have one)
- Ice cubes
- Tia Maria (or other coffee liquor like Kahlua)
- Vodka
- Decent coffee (filter coffee works, but just don't) Espresso works even better, but sometimes you don't have a fancy coffee machine at hand, so you have to row with the oars you have.
- A nice glass: if you don't have a martini glass, just get a nice glass which can hold 24 cl.
- Measuring cup ("Drankmaatje" in Dutch): or something you can measure 25 ml with.
- Sugar
- Your tiny thing: coffee beans



How to do it:

1. Make an espresso (40 ml). Mix this with the ice, 25 ml Vodka, 25 ml Tia Maria and half a teaspoon of sugar in the cocktail shaker.
2. Now shake it until your hand almost freezes (at least more than 30 seconds). If you don't do this correctly, your cream layer on top will be thin, and you want a thick cream layer. Because otherwise, the final step won't work. So shake like your life depends on it.
- Tip: while shaking, you can put some music on to make your shaking skills become more alive. Harry Belafonte with Jump in the Line (Shake, Senora) is a real cocktail shaker classic.
3. Pour down your drink in your glass without ice getting into it. So pour it down as though you are pouring your water out of your pasta pan down (this makes sense, yes yes). If you want a Dutch shaker classic: K3 with Hippie Shake!
4. That sweet Jesus cream layer you have created is a very nice bed for coffee beans. Coffee beans like to put into bed very nicely and preferably in a geometric shape.
5. Drink and enjoy!



Freeze your hands off

Now some people choose not to drink alcohol. So for those people, instead of putting alcohol in it, you put 2 cups of espresso in it and with your favourite flavoured syrup (like caramel, white choco, or hazelnuts). You still need to shake very well to get that nice cream layer.

Always drink responsibly and especially with this one. Now, if you get hammered on espresso martini's, you do have to warn your housemates. Not only will you have a nice headache the day after but since coffee works as a laxative. Furthermore, since it is booze it will make your feces smell which is probably not well appreciated by house mates. It is similar to your smell of hang-over beer poop, but then it smells like rotten coffee. But still, the Martini Espresso is f*cking nice to have after a nice meal. Enjoy!

A TINY POEM

INTRODUCING...

LAUREN HANSEN

This new lifeline member hails from California.
She regales our shores to become a master of Behaving
Cognitively and Neuroscientifically.
Her hair is wild and her hobbies no less so.
She dances and prances and lances objects in the air.
When she has no need for clocks,
she climbs trees and rocks.
On a pensive day she listens to podcasts and jots;
in her past she did sail and knew knots.
This strange foreign beast does come out for a feast,
or when it's time to play.
Look for her at her favorite time:
sunrise on a Sunday.



TINY DRINKS FOR YOU TO MAKE TO HELP YOUR FRIENDS LOOSEN UP A BIT.

DISCLAIMER! WE AT LIFELINE DO NOT CONDONE BINGE DRINKING. PLEASE DRINK RESPONSIBLY. NEVER DRINK AND DRIVE.



By Devi Seijkens

***“Since our favorite bars are
all closed, we need to make
our favorite shots at home”***

Apis:

One part Amaretto
One part Pisang Ambon
Two parts Apple juice
Mix thoroughly, serve as a shot or if you're a big player, just
make an entire glass, this one isn't that strong.

B-52:

One part Kahlua
One part Bailey's Irish Cream
One part Grand Marinier
Carefully pour each part in order mentioned above over the
back of a spoon into a shot glass. The three will create amazing
separate layers.

Rusty nail:

One part Drambuie honey whiskey liqueur
One part your favorite whiskey
Shake with ice, serve as a shot or over ice in a lowball glass.
This will put some hair on your chest, so don't overdo it.

Torture bomb:

A half glass of energy drink
A shot of Absinthe
Similar to the Jägerbomb, add a shot glass full of absinthe to
half a glass of energy drink. Chug the entire drink. This one can
really kill you, but I honestly enjoy the flavor.



QUANTUM PARTICLES

THE SMALLEST PARTICLES CREATE BIG QUESTIONS



By Lauren Hansen-
Manguikian

We all learned that light is both a particle and a wave, but did you know that this simple textbook fact has been driving physicists crazy since the 1920s? Even Einstein didn't like the implications of quantum theory. So what's the big deal with these little particles?

First off, what are quantum particles?

They are technically referred to as quantum *objects* because they are neither fully particle nor fully wave, so calling them a particle is somewhat misleading. The most common ones that come to mind are electrons and photons.

What is so special about them?

The properties of these objects are probabilistic. Basically, there is no way to know exactly where an object is until we measure it. The best we can do is describe an area in which it is likely to be. This is particularly special because as far as we know everything else can be predicted. Even something as seemingly random as a coin flip can be predicted if you could somehow analyze the movements of the hand as it flipped. The tiny world of quantum physics is the only place so far that we have not cracked the code on how to predict exactly where an object will be before measuring it. This means that this is the only possible source of randomness in our universe! So next time you want a decision to be truly random, consider measuring the placement of a quantum particle instead of flipping a coin.

How do we interpret this mystery?

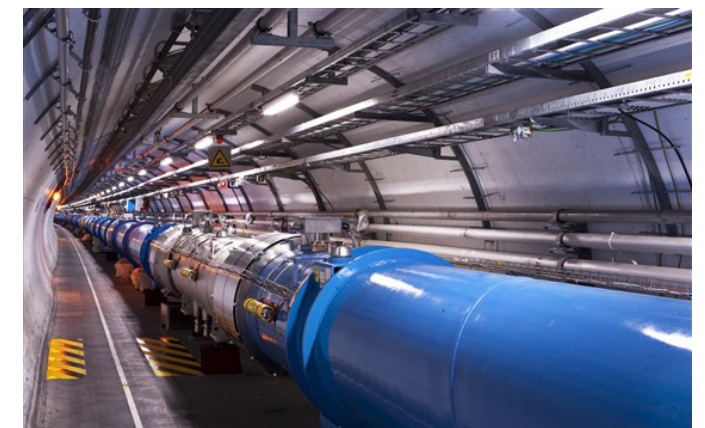
Physicists have many different ways of interpreting wave-particle duality and the probabilistic nature of the quantum realm. Some think that there is one set of rules for the way an object behaves when it is not being observed, and another set of rules for the particle's behavior when it is being observed. Sound crazy? Well the alternative sounds even crazier. One implication of the quantum equations is that every time a quantum particle is measured the wave function of the entire universe splits into multiple branches. For example an electron could be spinning clockwise, or it could be spinning counterclockwise. The act of measuring it causes both possible states to become realized, but in two separate worlds. This is known as the many worlds interpretation of quantum physics. Are there a finite number of worlds that can be created?

No one knows.

It could be infinite.

What are physicists doing about it?

Do you ever wish that smashing things together would get you the answers to your problems? That's not so far-fetched for the field of quantum physics. Physicists have decided that the best way to understand how quantum objects work is by smashing them together at extremely high speeds, hoping some new particle pops into existence long enough for the machine to measure it. This is the job of the Large Hadron Collider. It lies deep underground beneath the France-Switzerland border. It is the largest machine in the world, at 27km in circumference. The creation of this behemoth cost over 4 billion euros, took 10 years, and continues to cost about a billion/year to maintain. It has proven its worth to the scientific community with many experiments including the discovery of the Higgs Boson in 2012, landing the Nobel Prize to Francois Englert and Peter Higgs. But there is some controversy over whether it should be in use at all; it could create microscopic black holes!



When the tiny particles are accelerated to nearly the speed of light, they gain mass. This increases the force of gravity on the particle. When two such particles collide, this leads to a high concentration of gravity and mass in such a tiny space that a microscopic black hole could be created. While this is only a theoretical possibility, physicists have assured the public that even if microscopic black holes were created, they would be harmless. This is based on the idea that the universe does naturally produce particle collisions at or above the speed of the Large Hadron Collider, and these do not lead to black holes swallowing up stars as a result.

So what do you believe? Are quantum objects truly random? Are there many worlds? Could microscopic black holes be created with each quantum collision? Physics just doesn't have the answers yet.

LIFELINE REVIEWS

In these trying times, we all get lonely from time to time. Maybe plants aren't your cup of tea, like me, or you're starting to get annoyed by the way your partner breathes, so you need other ways to make new friends. Of course, we here at Lifeline got you covered. It's origami time baby!

We tested 6 different types of friends for you to try to make at home. The friends we made are Fox, Frog, Brachiosaur(Hereafter called by its real name: Brachioboi), Blowfish, Swan and Croissant(Food can be your friend, we don't judge here at Lifeline). We rated them on 5 different categories: Difficulty(to make), Cuteness, Frustrations, Functionality and Realism. Because these categories oppose each other at times, I will now discuss the friends we made by category, opposed to our usual format where we discuss them per tested item.



Frustrations

I like to go worst to first, so we'll start with frustrations. There were clear winners/losers in this category. The clear loser was the Frog, which scored an average of 8 for frustration. Our panel was unable to make this one for most of the time, as it was given many 10's for this category. The Fox and Brachioboi did very well here, scoring low across the board. Juultje gave the frog the official Lifeline Frustration award, while Nadia commented that the Frog's legs just looked like propjes.

Difficulty to make

Next up, we're looking for the challenge. Now this can of course be interpreted 2 different ways, as it being hard, or a nice challenge for the more experienced origamist. The clear winner here? Again the Frog, scoring a 7,9. All other friends we made scored similarly low on this category. Dana: 'The Frog was a real bitch. Those bloody squish folds.' Marit on the other hand really enjoyed the challenge, as she said the Frog turned out to be her favorite in the end.

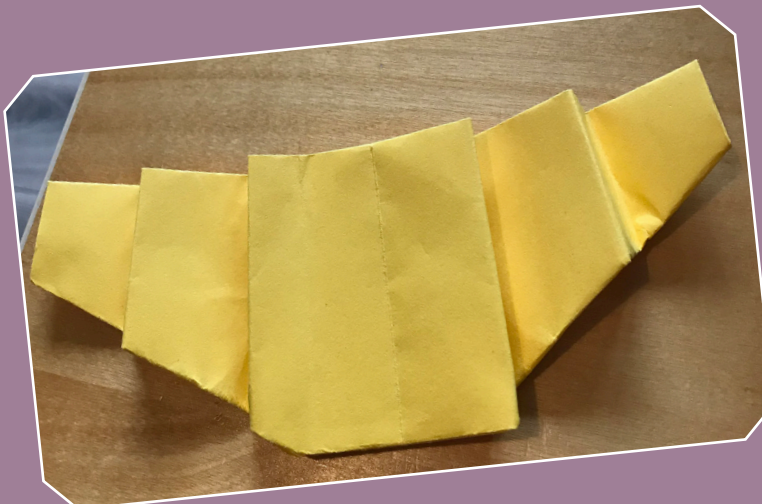


Functionality

This category is very nice. The scores here are all across the board. Coming in first place is the Brachioboi with a 7,2. Similar to its use in real life, the blowfish finished last, with a whopping 2,8. Jeez, Blowfish, get some more functions or something. Marit had a nice comment about the frog here, noting that she could actually make it jump! Renate: 'The blowfish lives up to its name: It blows. It's just a stupid piece of shit looking like a 4 year old's origami work. I hate it very much.' And Laurens: 'The blowfish looks for no meter on a fish.'

Realism

Second to last and in my opinion as writer of this article, second to most important category, realism. Surprisingly, the frog scored very well here, winning the category with a score of 7,5. The other scores were quite close, except for the blowfish, who again was a clear loser with a score of 3,5. Dana: '-I accidentally made a whale instead of a blowfish.' Juultje: 'The frog, even though it was most frustrating and difficult, also was the most realistic. The croissant really depended on execution for realisticness, and my execution was lacking big time.'



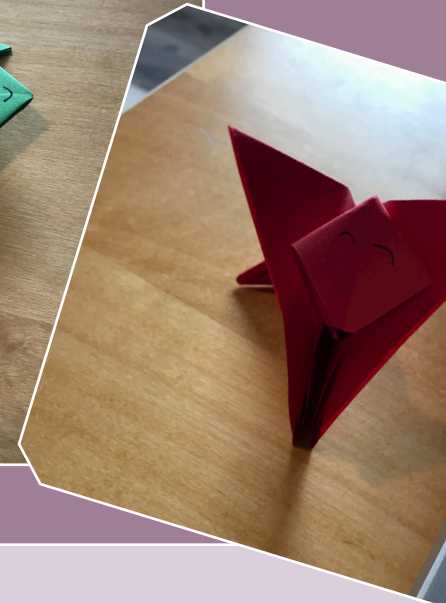
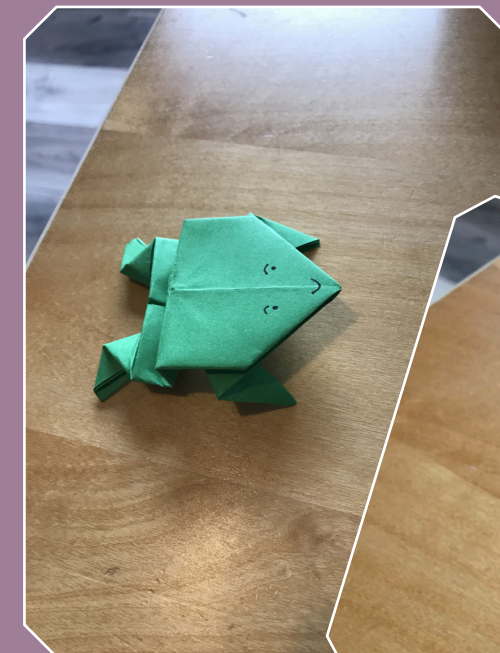
ORIGAMI



By Devi Seijkens

Cuteness

And last, and therefore most in this review, cuteness. Now, some of you might not agree, but I'm writing this review, so I get to decide which categories are important this time! And to me, origami is all about the cuteness of the stuff you make. This category was a clearcut win for our main man, the boi himself, the Brachioboi. It scored a whopping 8,6, with only the fox coming close with an 8,2. And there is so much passion for both of these new friends in our panel. Renate: 'Brachiosaurus is of course a 12/10, I love him. It does miss a long tail and for a dinosaur who was named after its legs, this boi does have some tiny legs.' Marit: 'The brachiosaurus could be cute if you are good at cutting and folding properly, which I am not. It was a hunchback brachioboi but hey still cute.' Nadia: 'Brachiosaurus was cool. Somehow I couldn't figure out how to fold the head and the tail but Juultje came to the rescue. Origami is just not my thing. Extra points for steadiness, could stand on its own without unfolding.'



Conclusions

So, what conclusions should we draw from this? Very simply put: You all need to try to make the brachioboi. Seriously, drop what you're doing and make it already, it's the best. If you like cuteness, go get that fox. If you're looking for a challenge, maybe the frog is something for you. It seems like one of those classic high-risk high-reward plays, and I'm a big fan of those personally. Either way, no need for any of you to be lonely, there's an origami friend out there for all of you!

Name	Difficulty	Cuteness	Frustration	Functionality	Realism
Fox	3	8	2	6	5
Frog	8	6	8	5	8
Brachioboi	4	8	3	8	3
Blowfish	4	5	3	3	4
Swan	3	3	3	4	4
Croissant	3	4	4	3	5

BAS EN Z'N BEESTJES

Beasts by Bas



A few lifelines ago, I introduced you to the amazing flea—a tiny thing with an impressive jump. Today I want to continue this line of thought with an animal that starts as a tiny thing but grows up to impressive heights. While its jump length is insignificant compared to the flea, this animal would still outjump any human competitor without even trying. This time Bas en zijn beestjes will take you across the globe to the quantitatively quizzical world of the kangaroo.



Kangaroos are marsupials that form, together with wallabies, wallaroos, and tree-kangaroos, the family of the Macropodidae, literally meaning large foot. However, the distinction between wallabies, wallaroos, and kangaroos is not based on genetics, but rather on size, with kangaroos, which can reach up to 2 meters, being the biggest and wallabies being the smallest. Because the morphology of the kangaroo doesn't allow its feet to move independently, its most efficient way of locomotion is hopping, with short bursts that can reach speeds over 70 km/h. When it is just cruising along, the hops are up to 9 metres high, with 70% of the energy required coming from its elastic tendons. However, when a kangaroo wants to go slow, it switches to a pentaduple walk, alternating its weight on its tail and forearms with its legs.

One of the most interesting things about the kangaroos is their reproductive system. It starts with the males having a two-headed penis (picture the Greek capital letter Upsilon) and females having three vaginas (Greek capital letter Phi). These vaginas, of which the two outer ones, allow for the penis to be led to two different uteri, meaning a female kangaroo can be perpetually pregnant. In practice, this happens quite often, and a female kangaroo is able to stop the development of her second embryo if another infant has not yet left the pouch. The downside of a three-way vagina is that the middle part, which is for birthing, has only limited space, and so, after only 31-36 days, the mother

gives birth to a lima bean-sized Joey. This naked, blind lima bean, which has only just developed its forelegs, then goes on a 5-minute horrific journey crawling and climbing from womb to pouch (if you thought only baby sea turtles had it rough, you are wrong) where it will attach itself to a teat not to leave the pouch for the next few months.

Most people know you don't want to pick a fight with a kangaroo, but male kangaroos do sometimes fight each other. However, similar to humans, most fights don't escalate and consist just of males flexing their biceps, after which the lesser male leaves. Research shows that the female kangaroos more often chose the males with the larger biceps. If you do, however, end up in a fight with a kangaroo, be aware of your left side, as most kangaroos are left-handed. One strategy that won't work is to try to corner the kangaroo as they are physically incapable of moving backwards. If you somehow manage to threaten the kangaroo, it might lure you to the water. Don't follow him! The kangaroo will try to drown you there, and you are not going to win that.

Unfortunately, I am running out of space, and kangaroos are so much more interesting as I just laid out. For example, they are, together with elephants and manatees, the only animals that show polyphyodonty (good word for scrabble), which means they regrow teeth from the back of their mouth. Or that the myth that their name means: "I don't know" in a local Australian language is false (and has been actively debunked since 1792). Or that they might be a solution to global warming as they barely produce methane (way more harmful than carbon dioxide) while eating grass and that researchers actually are studying the bacteria that cause this. Or that they can't sweat but occasionally lick their forearms to cool down. And then I haven't even started about the tree kangaroo (seriously, look up the tree kangaroo, they are adorable and fascinating as hell). *sigh* I guess there are a place and time for everything, but I hope I showed you today that the place of the kangaroo is in the hall of fame, and the time is already a few lifelines too late.



Een scherp oog!



Een scherp oog voor goed ecologisch advies,
betrouwbaar onderzoek en vakkundige analyse.
Al ruim 30 jaar lang.

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IDUZZLE...



By Juultje



-on



-sa



-f, -h



-c, -r



-o, -c, a=e



-fr



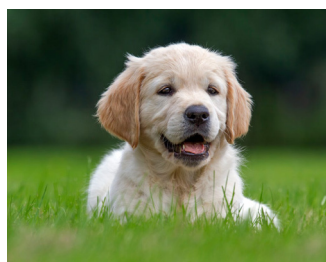
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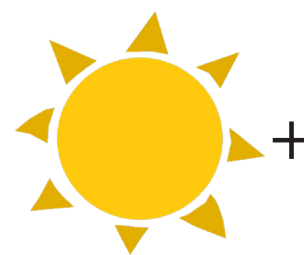
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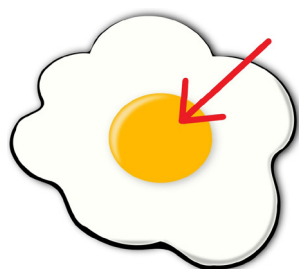
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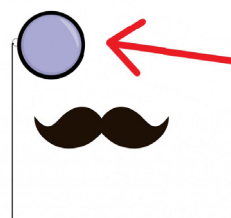
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The previous Iduzzle was won by **Sil van Zoest**. Congratulations! He has won a marvelous prize, which he is very happy with! Would you like to be mentioned here in the next Lifeline? Please submit your answer to the Iduzzle to redactie@idun.nl before March 15th.

Answer to iduzzle 61: On a scale of one to Arnold, how nice are you?

