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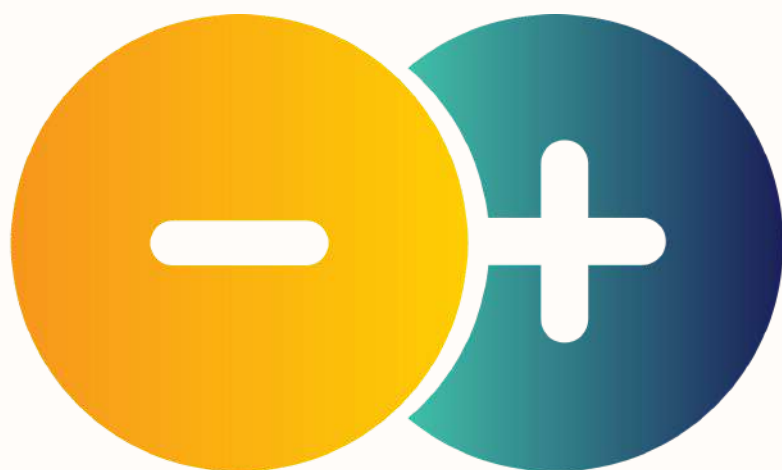
**INSECT STINGS**

**HOMEOPATHY**

## PLAY OF THE LIGHT

*Akhilesh Balaji*

An Article about LASERS, a much misunderstood concept; Akhilesh Balaji explores this in detail.



**THEGEEKLY**

The background is a vibrant collage of abstract shapes and mathematical symbols. In the top left, there are overlapping circles in shades of orange, pink, and purple. To the right, a large purple shape with a pink-to-orange gradient and a blue circle with pink and orange diagonal stripes are visible. A large orange shape is positioned behind the main text. In the bottom left, there's a green and yellow shape. The bottom right features a teal shape with a blue circle inside. Various mathematical symbols are scattered throughout: a white plus sign in the top left, a purple plus sign on the right, a pink plus sign in the middle, a blue circle with white diagonal stripes on the right, and a yellow circle near the bottom left. At the bottom, there's a logo consisting of a yellow circle with a white minus sign, a blue circle with a white plus sign, and the text 'THE GEEKLY' in bold, with 'THE' in teal and 'GEEKLY' in yellow.

# EDITOR'S NOTE


Hi, readers! We are delighted to announce our 1-year anniversary this year, opening with Issue 3. We have introduced few more widgets, including the context. We also invited Daniel C Dennett in this issue, and he is an expert on consciousness, and the evolution of the human brain. So far, I think that my favorite widget has been "Of the Month", as it doesn't talk much about each item, leaving you to learn more about them. As you might have noticed, we have a new logo now! Visit our website to read an article about the designing of this new logo. Read on!

Happy Reading,  
Akhilesh Balaji and Dhruv Ramu  
Editor and Founder of The Geekly  
[info@thegeekly.net](mailto:info@thegeekly.net)





**PLAY  
OF THE  
LIGHT**



**LASERS** are a concept that has appeared in various science fiction movies, giving the audience the wrong impression of what LASERS really are. Lightsabres (Star Wars), one of the most iconic movie props of all time uses lasers, but depicts it wrongly. **Akhilesh Balaji** investigates these mysterious rays...

The term "LASERS" may evoke extremely high tech images in your mind, maybe even stimulating a few scenes from your favorite Sci-Fi movies. You have probably always imagined lasers as some kind of futuristic light beam, but that is not really the case. Lasers are a much misunderstood concept, and this article will erase any doubts in your mind.

Let us first look at what light is made up of. Light, in physics, is any portion within the electromagnetic spectrum. For example, Gamma Rays and X-Rays may also be referred to as light. Light travels in packets of energy known as photons. These particles are known to behave in strange ways: They are in a superposition of states, and can either be a wave or a particle until measured. This state is known as quantum superposition.

The study of light is called optics. Light has many other interesting properties. Refraction, for example, is the process by which light waves are bent by passing through different mediums with different refractive indexes. This property of light can be experienced when you drop a pencil into a glass of water, the pencil will appear like it has been bent at the point where it comes into contact with the surface of the water.

Another interesting property of light is reflection. This is the process by which light rays bounce off other entities. This is the property that helps us see things. There are two types of reflection: Specular, and Diffuse reflection. The angle at which the light rays hit the surface is called the angle of incidence ( $\angle i$ ), and the angle at which the ray is reflected is called the angle of reflection ( $\angle r$ ). In the case of Specular reflection  $\angle i = \angle r$ , and in diffuse reflection,

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**“Focus like a laser, not a flashlight.”**

**—Michael Jordan**

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$\angle i \neq \angle r$ . Light can very easily scatter, and its brightness decreases as the distance to the light source increases.

Now, we arrive at LASERS. **LASER** is an abbreviation for "Light Amplification by Stimulated Emission of Radiation". Lasers are essentially light rays that have been narrowed down to a single point, and focus only on that single point. Thus, Lasers do not scatter, they merely concentrate a large amount of light onto that single point, making it very effective. In lasers, all the rays of light have similar wavelengths, so lasers cannot be white in color, as white is an amalgamation of all the colors of the rainbow.

In 1960, a scientist called Ted Maiman came up with the very first laser. Maiman essentially took a cylinder of ruby, and surrounded it with a xenon flash lamp that was used in photography. The cylinder of ruby then emitted a thin, and concentrated beam of light. To understand why ruby was chosen, we first need to understand exactly how a laser works.

If one atom is excited, it starts producing radiation, or photons. These photons go on exciting more and more atoms, starting a chain reaction. If this process is contained within two mirrored or reflective walls, the light waves will keep bouncing back and forth, getting brighter and brighter. To let the beam out, just open up a small hole in the wall, and it will let out a strong, cohesive beam of light: The laser beam. Sometimes, if the beam is too large, it is magnified down to a point by use of lenses.

Lasers are also used in everyday life: Computer chips and other metal parts are cut out and welded by high intensity laser beams. Lasers are even used in eye surgery. If the retina starts to peel off, surgeons used lasers to weld the retina back in place.

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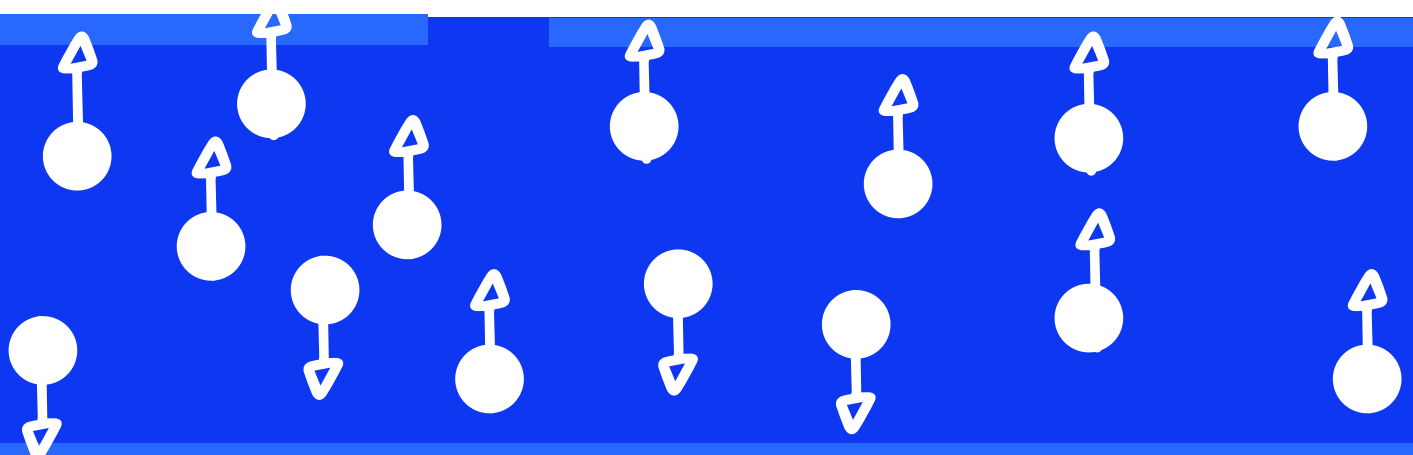
**"If GM had kept up With technology like the computer industry has, We \$25 cars that got 1000 MPG."**

**— Theodore Maiman**

One of the precautions that has to be taken while handling lasers is that they should never be pointed at the eyes. Pointing the laser at the eye can warp the cornea, or damage the retina.

Lasers have evolved from lab equipment the size of a desk to handheld cat toys. But, in whichever area they are being used, they will remain fascinating beams of light even capable of destruction of an entire planet. All you need is the power to do it.

**Must See**





# THE MUMMY

**Akhilesh Balaji** explores Egypt's most fascinating and  
misunderstood artifacts





Mummies are one of the most well-known, yet least understood icons of Egypt. Over a thousand horror movies have been made solely on the concept of mummies. Why did mummies get famous? And no one really understands what mummies are. Oh, I bet you can come up with an answer to that one! Mummies are dead, decomposing bodies wrapped in a bandage! No, It's quite the opposite, actually...

Mummies were invented by the ancient Egyptians as a way of preventing the bodies from decomposing. Instead, they would be preserved, and wouldn't rot away. For this purpose, the ancient Egyptians removed any organs that may decay and stored them in jars known as sarcophaguses. Every jar had an engraving on it, denoting the importance of the

organ it carried. Thus, if the soul of the deceased was in a "hurry" while leaving for the afterlife, it could quickly grab the organs that it needed.

But why did the Egyptians want to preserve their body at all, while in most other cultures, the bodies are burnt, or buried, therefore eventually disintegrating the body? The answer lies in the cryptic Egyptian mythology. The true meaning of this mythology is currently shrouded in mystery, as most Egyptian scriptures don't get straight to the point: The truths are veiled behind delicate metaphors, hidden under dark crevices whose shadows are lit only by the most complex inferences, all woven in an intricate web of flattery for the gods. But, from what little we understand of them, ancient Egyptians believed that their soul would live on after they died.





But, for their soul to properly live on, it needed a medium. This medium would be in the form of your body, or statues and paintings.

To start the mummification process, the perishable organs have to be removed first. The first organ to be removed is the brain. A hook-like tool is inserted through the nostrils and into the brain. The tool is then twisted around, turning the brain into a mushy pulp. The pulp is then drained back out of the cranium. Then, a small slit is made in the side of the body, near the kidneys, and all of the organs in the torso are drained out from there.

In Egyptian belief, the heart is the most important organ, as that was where the soul resided, so the heart was given special care while being removed. The body was then filled with a salt called natron. What was so special about natron?

Like any other salt, natron could prevent decay by killing bacteria. But natron is mainly a mixture of two alkaline salts: soda ash and baking soda. Alkaline salts are especially deadly to bacteria, and natron can turn fatty membranes into hard and soapy substances. The cranium was then filled with tree resin, and the body was set in a bed of still more natron to prevent the outer flesh from decaying. Then, the body is sealed with tree resin, and kept in a series of nested coffins, sometimes even a stone sarcophagus.

What makes mummies so famous? The study of ancient Egypt, or Egyptology evolved only 200 years ago. But, this field was first made popular by the discovery of King Tutankhamen's tomb. King Tutankhamen's tomb was discovered by the British Egyptologist, Howard Carter. This discovery is plagued by many unsettling deaths. Many people think that this "death wildfire" is not a mere coincidence, and has something to do with the curse of the pharaohs. There are inscriptions inside the tomb that hold eerie significance:

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*"Death shall come on swift wings to he  
who dares disturb the peace of a king"*

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Mummies help us learn more about the ancient Egyptian lifestyle and environment. Egyptian mummies are surprisingly well preserved, and scientists can still do autopsies on them to find out the cause of death.

For example, we know that pollution was a big issue in ancient Egypt. And that heart problems were a common cause of death.

The concept of mummies, though highly influenced by ancient Egyptian beliefs, are an intellectual feat after we look at the limited technology in that era. Inside every mummy is a story waiting to be told...



# Gentle Healer

Dhruv Ramu

Homeopathy, in simple terminology, is a holistic medicine which uses specific highly diluted substances prepared and sold in tablet form. The aim of homeopathy is to trigger the body's own healing mechanisms. A homeopath is a type of doctor that prescribes medicines according to the patient's symptoms and/or diagnosis, how it is experienced, and also taking into account the level of health. Homeopathy is based on the simple concept of "like treats like". What does this simple sounding principle mean? Substances which cause symptoms of diseases or problems when taken in large doses can be remedied by using small amounts (highly diluted) of the same substance. For example, a remedy against fever can be made of belladonna, a cause for fever. A mixture of bee venom can be utilized to treat itchy skin. We can find many examples such as aforementioned, but let us understand more about this.

Potentization, quite simply, is the idea that diluting normally harmful substances activates their curative powers, whilst enhancing its effect. How does this happen? Here's one way homeopaths dilute the substance. They take one part of the solution and pour it in a crucible or plate of distilled water/alcohol. Then, this part is diluted to the extent that it is 1/10th of the original solution. This along with distilled water is placed in a test tube. The test tube is shaken hard, until it reaches a stage called 1X Potency. This is when there is one part ingredient and nine parts solvent. Now, this process is repeated by taking 1 part from 1X Potency, mixing it with 9 parts of distilled water and shaking it again. Now it reaches... You guessed: 2X Potency. This process is repeated again, and again, and again (You get the point.) As potency increases, the fraction changes dramatically. 20X potency is like dropping one aspirin pill into the whole Atlantic Ocean! It can reach 20X or further and then this remedy is consumed orally as a liquid, or is inserted in little sugar pellets called globuli.



There are also more extremities to potency. C, means 100 from the Roman Numeral, as X is 10. C alone is one part ingredient and 99 parts water. 30C? Well, this page would be filled up by this extreme ratio 1:1000000000(many zeros.) Is 30C Potency actually sold? It is actually commonly sold as homeopathic medicine across the world. Potency is indeed important to the effect of homeopathic remedies. The less ingredients compared to the distilled water is supposed to increase the effect of the medicine. One question that is posed is that, if the substance is diluted so much – like 30C, and there is not even a single atom of it left, how is it still helpful? The answer to this is difficult to explain as there are always boundaries to human knowledge. What really happens is that there is a spirit-like essence of the substance in the water, which cannot be measured. In that case, shouldn't the whole ocean be amazing homeopathic medicine due to its exposure to harmful substances? Filtered water from the tap would still have an essence of harmful substances? Well, no. Homeopathy is still an incredibly successful alternative to drugs. Now, let's trace back the history of homeopathy. The actual concept of treating diseases.



“like with like” dates back to the Greek civilisation, more specifically 460-377 BCE, Hippocrates. However, the modern idea and form of homeopathy that has been used worldwide was discovered in Germany. It was discovered by a German doctor, Samuel Hahnemann, who was at the time, looking for a way to reduce the harmful side effects associated with the medical treatment of his day, which included the use of poisons and had medical procedures like blood-letting, causing even further problems. He discovered that as well as reducing toxicity, the medicines became more effective as the doses

were lowered. Hahnemann also created a long list of requirements for his treatment remedy to work. This included no playing games, no riding horses, no eating meat, no wearing clothes from sheep wool and many more. However, you may have noticed that most of Hahnemann’s list is not applicable any more. That is because modern technology and medical equipment has helped us figure out that not all of this is important to being remedied

Homeopathy, actually has a positive effect on the human brain but technically, does not have any effect



beyond that. Now, how exactly is it working? How does it help people and why is it still famous? (Homeopathy has an incredibly wide audience, with the market expecting to reach 17 billion dollars by 2024.) There is enough evidence and proof from reports that homeopathic remedies have cured children, adults and animals from various impediments—from simple fever to more terrible diseases.

Now, we must think of this concept called 'The Placebo Effect'. The concept is spoken about often, but the name is not known to all. Quite simply, it is the idea that if a patient is thinking he/she will feel better, the body's immune system believes it too, and therefore the trust alone causes the desired effect. This is very real, and not an unproven hypothesis. Also, the Placebo Effect can impact others too. Happy parents do have a direct correlation with happy children. Not just that, but if the parent believes his/her child will be cured, the child is in tune to the emotions. So, the child will believe the same. Even animals like dogs and horses react to the body language cues of their carers. Finally, time plays an important role in the curing of most infections. A fever will pass even if the patient has taken homeopathic remedies or not. However, the belief in it is

strengthened as the patient consumes the remedy, he/she feels that it was the reason that the fever was cured. Back to an initial idea in this article. Consultation is a very important part of homeopathy. This is because the patient talks to the doctor for a few hours, and is very personal. This level of empathy and care can make a positive difference on the well-being of the patient.

This is an important difference between homeopathic clinic consultation and most modern hospitals. In today's world with a high population, antibiotics and such medicine is a good thing. However, there are low budgets, so the consultations are quick, time-efficient, and the patients sometimes feel left behind or ignored. That is a point of improvement for modern medicine.

To conclude, as important as empathy is to well-being, patients diagnosed with cancer and other diseases cannot fight it with just the assistance of belief. That is where modern medicine, radiotherapy and chemotherapy comes in to save the patient. A combination of both faith, guidance and proven treatment causes the survival and cure of patients.

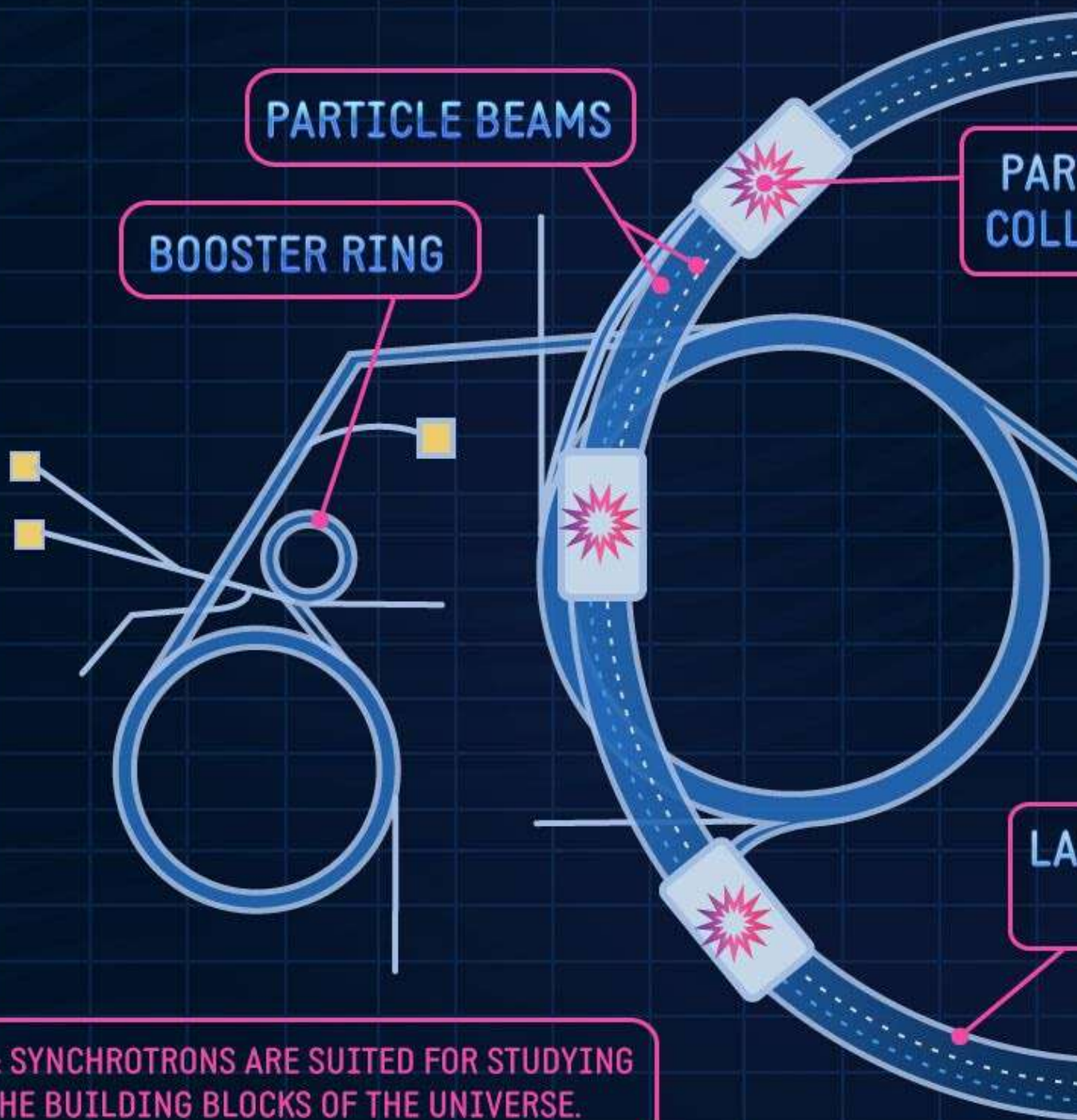


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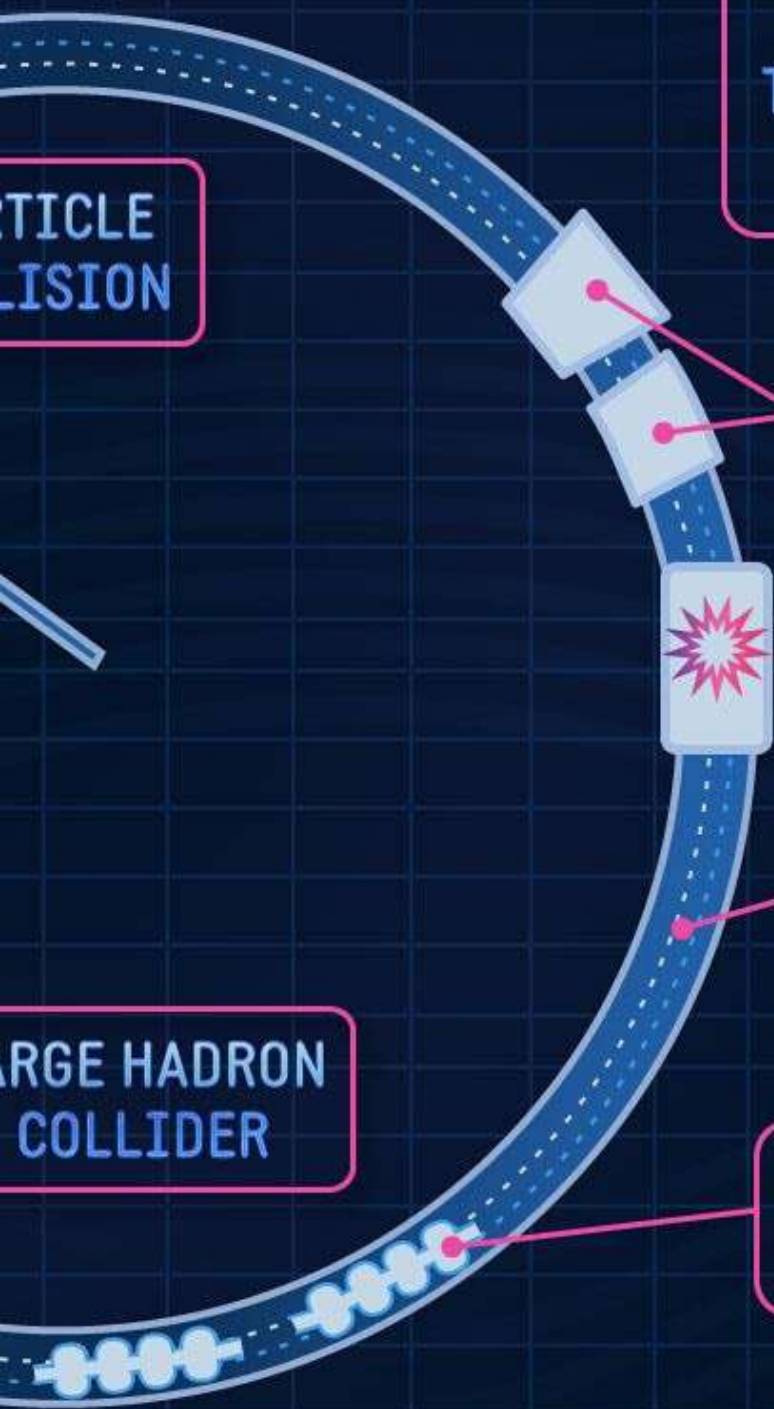
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A close-up photograph of a wasp on its nest. The wasp is positioned diagonally across the frame, with its head at the top left and its abdomen extending towards the bottom right. The nest is a cluster of light-colored, hexagonal cells. The background is a dark, textured surface. The text "5 TINGLING TORTUROUS STINGS" is overlaid on the image. The number "5" is large and yellow, flanked by horizontal lines. The words "TINGLING" and "STINGS" are in white, and "TORTUROUS" is in yellow. The text is centered and reads "5 TINGLING TORTUROUS STINGS".

# 5 TINGLING TORTUROUS STINGS

Top 5 Most Painful Insect  
Stings





## Warrior Wasp

These terrifying, nightmarish ghouls clad in black armour are scary enough. But, they have a special power: The sting of death. Warrior Wasp stings are like "Torture. You are chained in the flow of an active volcano." These insects are over 2 inches in length, and their jaws are bigger than their front legs.

Warrior Wasps are very aggressive, and are known as drumming wasps in the local regions, as they beat their wings in a synchronized manner.

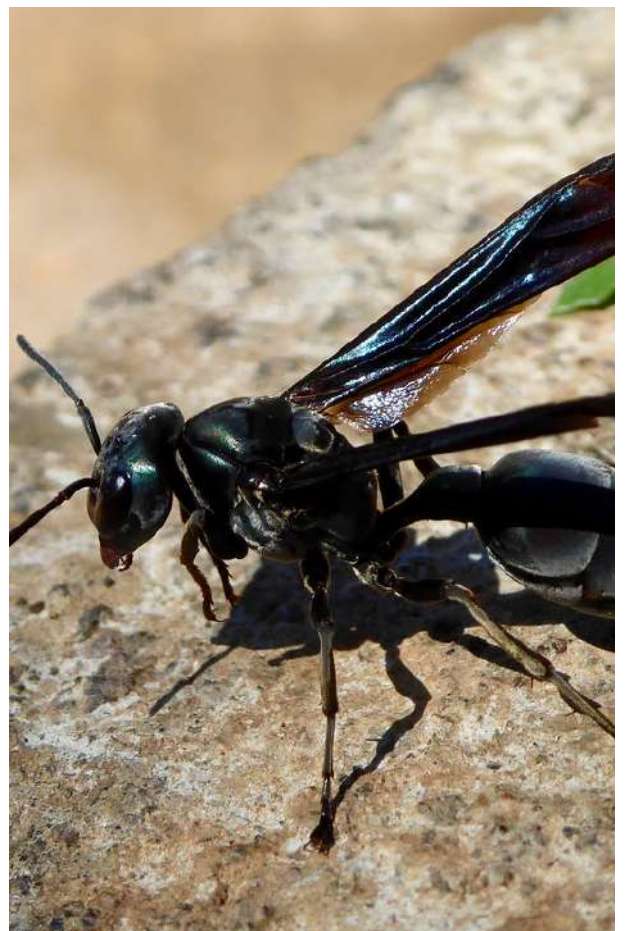
The warrior wasp is mainly found in North and South America, and is unlikely to be migrating to the east anytime soon.

## Paper Wasp

Paper wasp stings have been described as "Caustic and burning. Distinctly bitter aftertaste. Like spilling a beaker of hydrochloric acid on a paper cut." They aren't exactly the most painful on this list, but not the most pleasant either. Their name comes from the material that their nests are made of. They weave plant fibers into tight meshes that are similar to the paper that we use everyday.

## Harvester Ant

The Red Harvester Ant are reluctant to sting, but when they do strike, It may require medical attention. Schmidt described it as "After eight unrelenting hours of drilling into that ingrown toenail, you find the drill is wedged in the toe." Their nests are located in flat, open areas, and it's easy to step on them without looking, inviting a storm of these vicious insects that are only #4 on our list.



## Bullet Ant

Up next, we have the bullet ant. Schmidt describes the pain of being stung by a bullet ant as "pure, intense, brilliant pain. Like walking over flaming charcoal with a 3-inch nail embedded in your heel." This is the penultimate danger when walking through the Amazon Rain forest.

Satanic though its sting may be, did you know that a tribe in the Amazon has a ritual where young men have to be repeatedly stung by these insects? They slip their hands into gloves stitched with these insects, over and over again, until they can take the stings without shedding a single tear. That is when they are considered a man.





## Executioner Wasp

The Executioner Wasp. Its name is enough to instill fear in whoever hears its name. Other than its monstrous size, unusual colors, and petrifying name, this wasp has another punch to pack. This is its sting. The wasp's sting is almost as big as its thorax. The Executioner is actually the largest species of paper wasp that we know of.

It wasn't on the Schmidt scale, until Coyote Peterson, a YouTuber famous for getting stung by insects, got himself stung by one. "Man, the initial impact is definitely just as sharp, if not worse, than the Tarantula Hawk. But look, you can see the blood underneath the skin. Right now, my arm is throbbing. It is on fire."





# DRUG

**Drugs and their dreadful onsla**

*Akhilesh Balaj*



# GG'D

thought upon humanity.

**Must See**





Peer Pressure. Stress. Problems. Problems. More problems. These are just some of the factors that lead some individuals to turn to drugs for support. Little do they know that these drugs are slowly killing them from the inside, incapacitating their brain with every dose, eventually driving them to the point where they cannot live without drugs. Believe it or not, human society is slowly falling prey to illicit drugs.

First, let's have a look at why particular drugs are illicit, in the first place. Certain drugs, such as nicotine, cocaine, and meth force your nervous system to be sustained only by the presence of that drug. So, your body becomes accustomed to the drug, and cannot survive without it. Your nervous system becomes completely dependent on the presence of that drug. And, that isn't bad enough, the drug doesn't just sit there inside your body, waiting for something interesting to happen. It begins to take action almost immediately.

To understand some of the health consequences of drug misuse, we will first classify the illicit drug effects into two categories: short-term, and long-term. Some short term drug effects on the body include proneness to heart attacks, seizures, strokes, brain disorders, and even death. Long term effects can include heart or lung

disease, cancer, HIV, and AIDS, among others. These effects need not only be physical: they can be psychological, too.

Now, let's have a look at the different types of drugs available on the black market. There are depressants, hallucinogens, and stimulants. Depressants slow the messages going in and out of your brain, slowing your reactions to stimuli, and affecting the release of adrenaline. They, when taken in small quantities, make you relaxed, and less inhibited. They affect the coordination of your body organs, making you appear disoriented. One such example of a depressant is cannabis.

Hallucinogens, as the name implies, make you hallucinate, and distort your perception of reality. Some effects of taking hallucinogens can be seeing things that aren't there, or an altered

version of reality. Some examples of hallucinogens include Ketamine, and Lysergic acid diethylamide (LSD).

Lastly, there are stimulants. These, in fact, are quite the opposite of depressants. They speed up the messages sent to and from the brain, making you feel more alert, and confident. These can cause increased heart rate, blood pressure, and anxiety in large amounts. Two well known examples of stimulants are methylenedioxymethamphetamine (ecstasy, or MDMA), and cocaine.

Substance abuse, or misuse of illicit drugs, are not a new problem that the society is facing. Though the misuse of illicit drugs has greatly magnified over the decades, drugs have always existed, and been used by humans. Take, for example, the Mughal emperor, Nur-ud-din Muhammad Salim,

known more commonly by his title, Jahangir. Jahangir authorized trade and use of opium, a commonly used, perfectly legal drug, at the time. Jahangir himself, according to some sources, himself was an opium addict. And this was during the 1500s. "Attempts to understand the nature of illicit drug abuse and addiction can be traced back for centuries, however, the search has always been limited by the scientific theories and social attitudes available or dominant at any one time.", according to David F. Musto, a pioneer in illicit drug abuse research.

Illicit drugs, however effective and/or harmful they may be, are just a self-inflicting method of distracting the mind from the problems that arrive in the journey of life. There may just be simpler solutions to these problems. Why ruin the one chance you have at life by beginning your journey to the dark side?





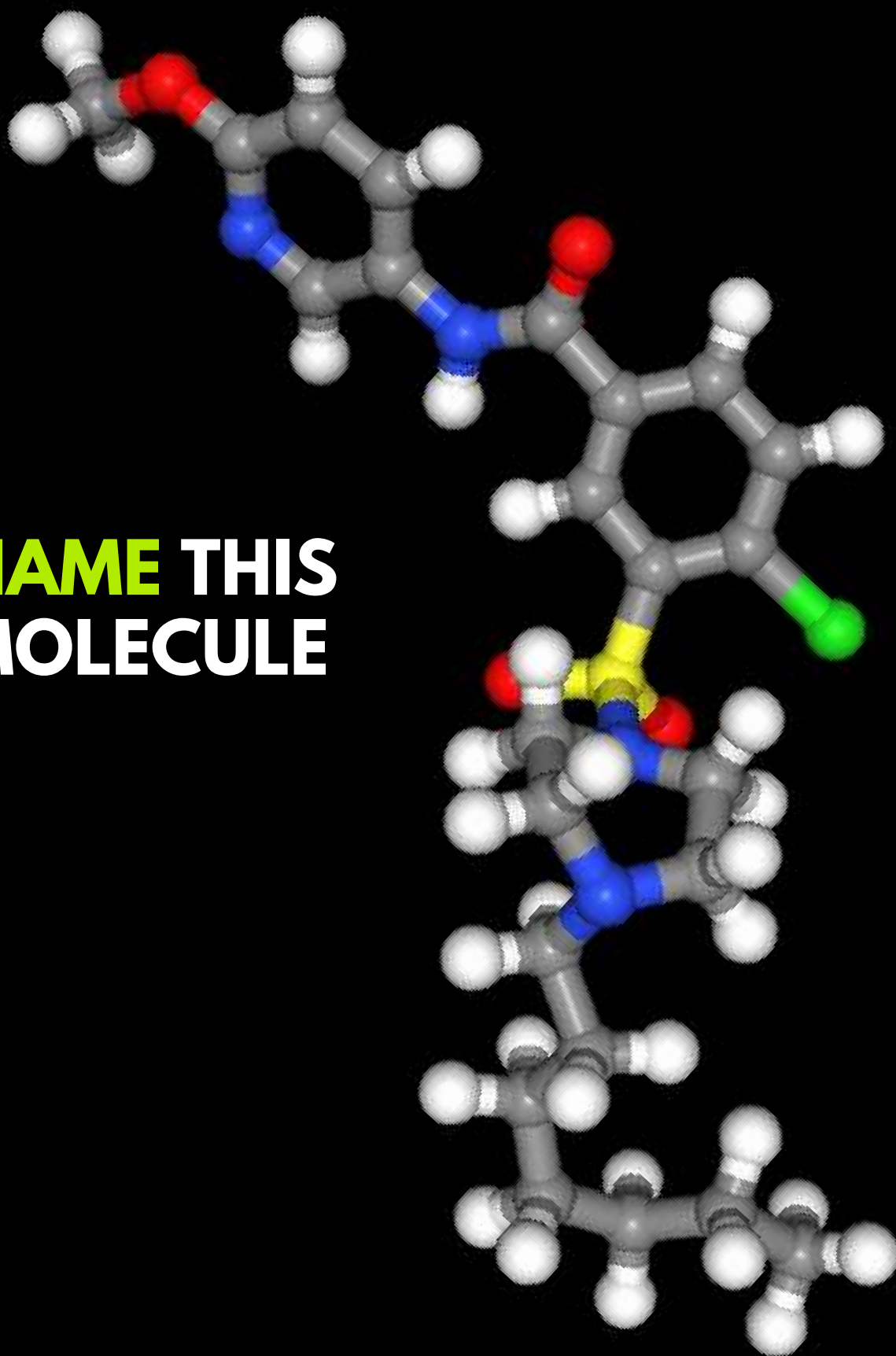
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# ON TRACK TO A STANDARD MODEL

DANIEL C. DENNETT

I applaud the ambition and optimism with which the authors lay out their case for a “single, coherent explanation of consciousness” that can unite GW, HOT and illusionism into a “standard model” based on their Attention Schema Theory (AST). I think they are basically right, and although I have some misgivings about a few of their ways of putting things, and think they underestimate the scope and complexity of their own theory, in the spirit of advancing their project, I will devote most of my commentary to adding what I take to be friendly amendments and clarifications.

I will highlight the themes I find most important. “I-consciousness is what the brain actually has; m-consciousness is what the brain thinks that it has.” Yes, i-consciousness is the dynamic informational system that is physically realized in the brain (in one variety of global workspace or another), and that accounts for all the behaviours, talents and dispositions that persuade us that an organism is conscious in one way or another. Chalmers’ “easy problems” (Chalmers, 1995) are all solved or solvable in a developed theory of i-consciousness. But it is somewhat misleading to say that the brain thinks that it has m-consciousness; only (the brains of) people – and particularly reflective people – think that they have m-consciousness. Dogs’ brains have i-consciousness systems similar in many regards to

those in our brains – they have attention-systems controlled by competitive sub-assemblies that determine what gets enhanced when – but their brains don’t generate the theorists’ illusion that our brains do, primarily because dogs don’t ever learn to compare notes with their conspecifics, to communicate about what is going on in their brains.

“Dogs presumably do not think there is something it is like to be them, even if there is. It is not that a dog thinks there isn’t anything it is like to be a dog; the dog is not a theorist at all, and hence does not suffer from the theorists’ illusion. The problems for us humans, and mainly just for those of us humans who are particularly reflective. In other words, dogs aren’t bothered or botherable by problem intuitions. Dogs – and, for that matter, clams and ticks and bacteria – do enjoy (or at any rate benefit from) a sort of user illusion: they are equipped to discriminate and track only some of the properties in their environment.” (Dennett, 2019, p. 54)

The authors speak of the “cultural ubiquity” of the m-consciousness belief, which nicely draws attention to the proposition that m-consciousness is a myth, just as much an artifact of human sociality and cultural exchange as is religion or music. The fact that it is such a natural byproduct of human communication, based as it is on deep facts about the i-consciousness we humans share, leads most theorists to intuit (not infer) that it is simply undeniable. But as the authors note (p. 23), all the “arguments” for the existence of m-consciousness are patently circular.

The illusion of m-consciousness (Frankish, 2016, 2017) is a myth, but not a mere cultural ornament; it is “the brain’s quick-and-dirty, but useful model of i-consciousness.” (p. 14) This shared noticing of our own attention schemas enables us to control our attention in ways that dogs and members of other species cannot. Our human capacity for self-control (and the control of our conspecifics) dwarfs that of all other species and is the foundation for our culturally developed and endorsed traditions of moral responsibility. This unique talent depends on our having an attention-schema that models (sketchily) the dynamic processes of attention-allocation, permitting us – and only us – to notice when the neural competitions for attention get out of balance, captured by some accidental or possibly malign intrusion, and then to act on our noticing, by directing our attention elsewhere. “When you are aware of something, you can choose to act on it.” (p. 20) Dogs and other animals do exhibit some modest capacities for noticing their noticings, but we humans have mental lives that teem with such episodes – so much so that most people have never even imagined that the mental lives of other species might not be similarly populated. Watching a raccoon figure out how to screw off a trashcan lid, for instance, we readily furnish its mind with hunches and surmises and hopes and expectations that we suppose it consciously entertains, without acknowledging so much as the possibility that the raccoon may get the benefits of an internal process of trial-and-error (it is a Popperian creature, trying things out in its head before acting, Dennett, 1995) without realizing it. As the authors note, “We have a hair trigger for attributing consciousness, because it is so socially useful that it is better to mistakenly overuse it than mistakenly underuse it.” (p. 30) One of the merits of AST is that it admits of grades and degrees. Instead of asking whether the lightbulb of consciousness is ON or OFF, it asks what levels of control-of-attention are implicated in the repertoire of this animal or person.

Why has the intimate link between consciousness and control not been more widely explored? Here’s a hypothesis: most theorists of consciousness don’t even try to ask what I call the Hard Question: And then what happens? (Dennett, 2018). They develop the “inbound” half of their models – getting from photons and pressure waves all the way up to subjective experience (whatever that is) and then they stop. They sometimes even endorse stopping, so as to isolate “the neural basis of conscious perception itself” from all “post-perceptual cognitive processing.” (Block, forthcoming) But you can’t understand the power of a key by studying it in isolation; you have to study the lock into which it is designed to fit.

Another reason why the link is ignored, I surmise, is because the prospect of investigating the underlying processes of control of attention seems to fly in the face of our misguided convictions about m-consciousness. Tradition has it that “we” are somehow “directly”, “incurably”, or even “infallibly” in touch with the

“phenomenal properties” of our subjective experience. We tend to think that no relation is more intimate than the relation between us and our “qualia”. But a scientific account (from the “third-person point of view”) of the underlying machinery, which must be there to get “us” from subjective experience of an apple to our ability to tell others – or ourselves – that we are experiencing an apple, must necessarily renounce all presumptions of magical directness.

Some aspects – content aspects – are “cognitively accessible”, and the rest are not. It is important to note that, as the AST makes clear, cognitive inaccessibility is always the default case. It takes extra machinery, an extra layer of representation-consumption and subsequent control, to make something accessible “to us”.

To see the awkwardness of asking the Hard Question, it helps to walk through a simple case from start to finish:

Spy (on his cell phone to his handler): Smith’s house has a dark blue door.

Handler: How do you know?

S: I’m looking at it right now, and there’s plenty of light, and my GPS tells me that this is indeed Smith’s address – oh, and my eyes are open.

H: OK, so the light comes in your eyes. Then what happens?

S: Well, I ... see the blue door. I know that this depends on a lot of activity in the retina, optic nerves, lateral geniculate nucleus, striate cortex, ... the temporoparietal junction, but that is all stuff I’ve learned about second-hand from reading cognitive science books and articles. All I know directly and intimately is that I see the door. Well, that’s too strong, I guess; I seem to see the blue door. My subjective experience is of a blue door.

H: How do you know that is your subjective experience?

S: What do you mean? I just do know!

H: That won’t do, I’m afraid. You’ve just now vehemently expressed your opinion about your subjective experience, but I want to know how you were enabled to do that.

Here are two things S might then say:

M–C: I am directly acquainted with a phenomenal property or quale, subjective blue, and another, which might be called door-shape straight ahead. It is my direct acquaintance with these properties that enables me to tell you about them (of course).

I–C: Well, I’ve never seen any details on this, but presumably my brain was able to, um, discriminate some internal state as a representation of blue, and ... enable another part of my brain to activate the English word “blue” and endorse a link of some kind between the word and the representation (ruling out competing alternative links as somehow inferior) ... but it must be much more complicated than that and none of the details are cognitively accessible to me. I don’t know how I am caused to have the conviction I just expressed, but I still have it.



S should abjure the M–C option, since it is nothing more than “a lingering fragment of a larger cluster of physically incorrect beliefs.” (p. 8) An important point that should not be overlooked is that S and H have to learn how to do all this. We human beings aren’t born knowing how to talk about, or direct our attention to, or discriminate ... our subjective experiences. There has to be a process that is both cognitive and social that sculpts our ability to “introspect” and even as adults we can discover embarrassing gaps of “ineffability” that can be filled in with training and practice. Acquiring all those talents installs cognitive machinery in our brains that is useful not just for sharing experiences with our family and friends, but for controlling our attention in myriad ways. (See Dor, 2015 for a rich and imaginative theory of this. See also Markkula, 2015.)

The authors actually address the dual task confronting any theorist of consciousness: putting the third person, physical scientific model of i-consciousness in registration, somehow, with “I”-talk and “we”-talk. Some otherwise insightful theorists often simply punt:

"We can't possibly know (let alone keep track of) the tremendous number of mechanical influences on our behavior because we inhabit an extraordinarily complicated machine." (Wegner, 2002, p. 27)

I never have the sort of direct access that my mindreading system has to my own visual images and bodily feelings. (Carruthers, 2009, sec.2 para.8) (For discussion, see Huebner & Dennett, 2009) (Emphases added in both quotations. Where did these “I”s and “we”s come from?) Both Wegner and Carruthers have made significant contributions to the clarification of the relationship between what I have called the personal and subpersonal levels, but they give themselves poetic license to make these entirely reasonable assertions without noting the background presumption that is needed to keep these observations from being dualist nonsense: the personal level is itself a user-illusion, one of nature’s greatest inventions, and they are exploiting that very illusion in making these claims. There is much more in this essay that deserves careful discussion, but first we should welcome it and take it seriously as a worthy candidate for a “standard model” of human consciousness, not just a bold philosophical conjecture but an empirically buttressed and detailed

articulation of what should now be recognized as the “obvious default theory” (Dennett, 2016), incorporating many of the fruits of recent efforts across several fields, and well positioned to incorporate many more.

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A vibrant cosmic background featuring a dense field of galaxies, nebulae, and star clusters. The colors range from deep blues and purples to bright oranges and yellows, creating a sense of depth and vastness in space.

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## Gadget 3D Pen



A 3D pen is a pen that prints in 3 dimensions. To make it easier, think of your ordinary glue gun – with colored glue sticks and a smaller tip. But instead of gluing things together, the colored plastic that oozes out of the pen's nozzle is used to draw figures and artwork.

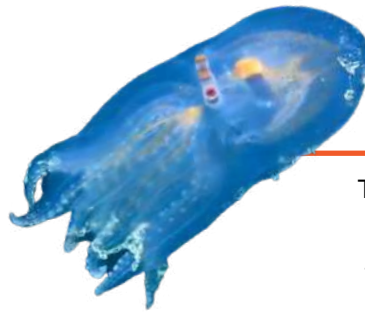
# OF THE MONTH

## Material Vantablack

Vantablack is a material developed by Surrey NanoSystems in the United Kingdom and is one of the darkest substances known, absorbing up to 99.965% of visible light. The name is a compound of the acronym VANTA (vertically aligned nanotube arrays) and the color black.



## Species *Amphitretus pelagicus*



The *Amphitretus pelagicus*, better known around the world as the telescope octopus is a species of pelagic octopus found in regions of the Pacific and Indian Oceans. What is interesting about it is that it is found in the depths of the Mariana trench, Earth's deepest point. This octopus is almost colorless, and has eight arms. Another special fact is that it has tubular eyes, hence its name.

## Element Gallium

Gallium is a chemical element of the periodic table with the symbol Ga and has an atomic number of 31. At standard temperature, gallium is a soft, silvery blue metal, however this can vary as in its liquid form, it is a silvery-white. Gallium has a melting point of just 29.76 °C, therefore using a hot palm, you can bend an object (like a spoon made of Gallium.)





## Compound Xonotlite

Xonotlite is a mineral that crystallizes in the mono clinic - prismatic crystal system with typically an acicular crystal form or habit. It can be colorless, gray, light gray, lemon white, or pink. It is transparent with a vitreous to silky luster. It leaves a white streak.

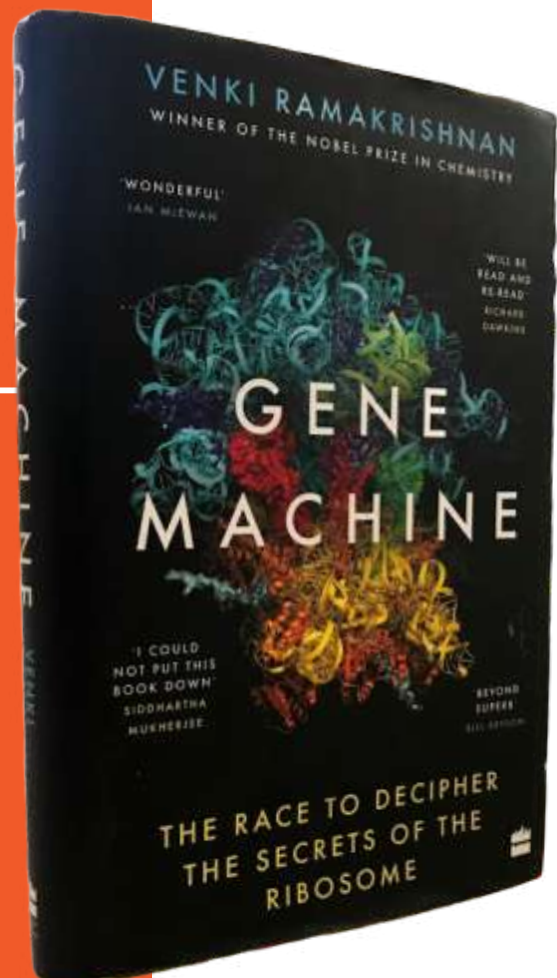


## Scientist Robert Lang

Robert Lang is an American physicist who is one of the foremost origami artists and theorists around the world. Lang has studied the mathematics of origami using computers, and also has computed theories about origami.

## Book Gene Machine

Everyone knows the term DNA: it is the essence of our being - it determines who we are and what we pass on to our progeny. Mention the ribosome, on the other hand, and you will usually be met with blank faces, even from scientists. And yet without the ribosome, nothing lives. For if DNA is data then the ribosome is the machine that processes that data. Unlocking the secrets of this gene-reading molecule was once among the most fundamental problems in molecular biology. Gene Machine is the thrilling story of how three scientists including Dr Ramakrishnan succeeded in decoding the ribosome, later winning the 2009 Nobel Prize in Chemistry.



A dark, grainy background filled with numerous white, glowing lines that represent particle tracks. These tracks are highly irregular, with many loops, spirals, and branching paths, suggesting a complex and chaotic environment. The lines vary in brightness and thickness, giving a sense of depth and movement.

**WHAT IF?**

**You stuck your head in a particle accelerator?**

This isn't just a hypothetical situation: It has actually occurred.

On 13 July 1978, a Russian Scientist called Anatoli Petrovich Bugorski was working with the Synchrotron U-70, a soviet union particle accelerator. While bending down to check a piece of malfunctioning equipment, a high intensity beam of protons passed through his skull. According to Bugorski, he felt no pain, but he saw a flash of light brighter than a thousand suns. The beam has passed through his left cheek, burnt a hole through his brain, and exited through the left side of the skull. The beam that went through Burgoski's head was 2000 grays, and it only takes around 5 grays to kill a person.

Astonishingly, he still lives. Although Bugorski appeared fine for a while, the left side of his face soon ballooned out of control. It also burnt a line through his brain, though this did not affect his intellect. Soon, he lost his hearing in his left ear, and the left side of his face developed no wrinkles, like it was frozen in time 50 years ago. Anyone fancy wrinkle removal through a particle accelerator?

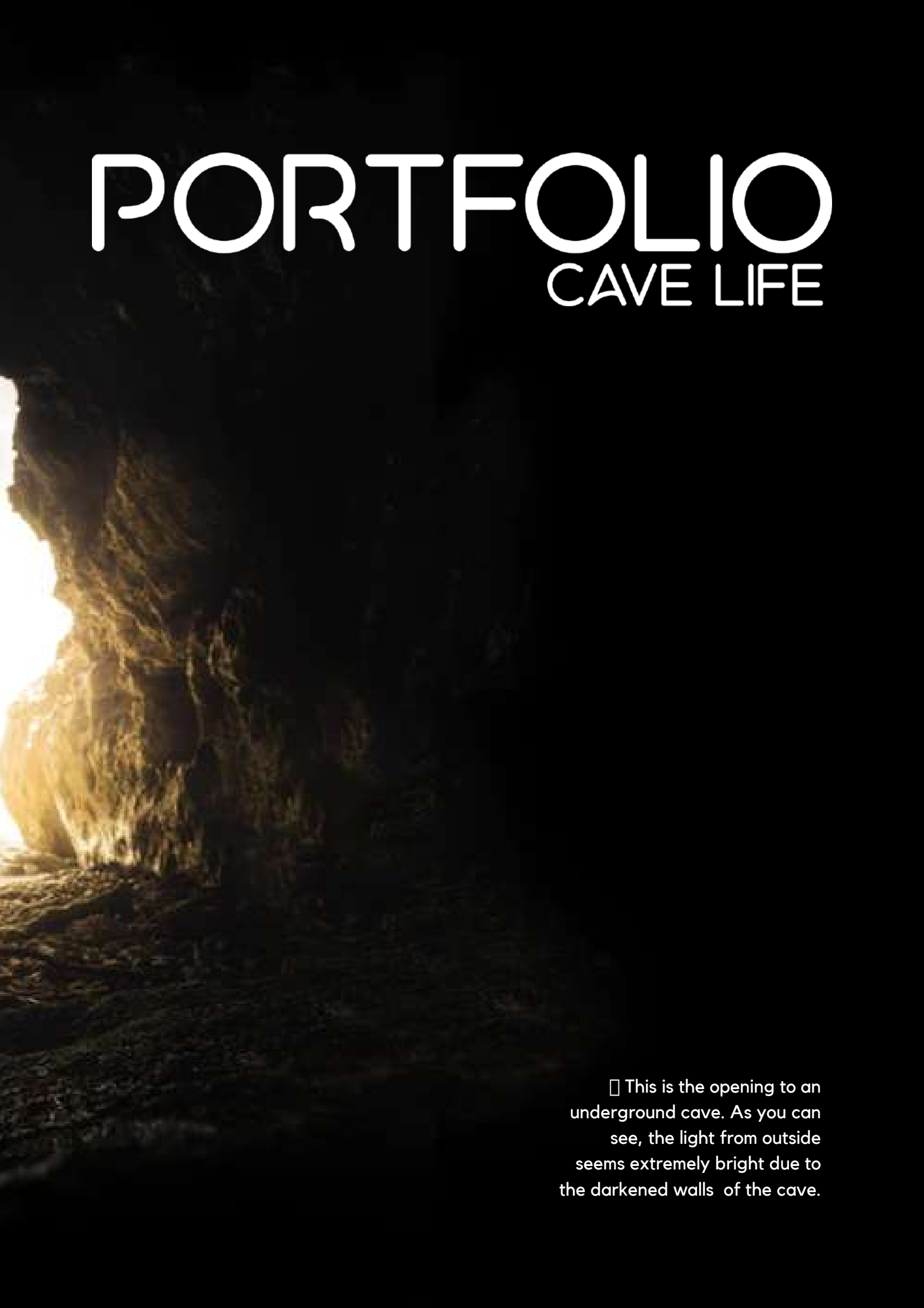
**-Akhilesh Balaji**





# PORTFOLIO

## CAVE LIFE



□ This is the opening to an underground cave. As you can see, the light from outside seems extremely bright due to the darkened walls of the cave.



□ This is the giant huntsman spider. It is of nightmarish proportion, and has good eyesight. It also detects prey through vibrations.

□ This is a blind cave salamander. It is a shy creature, and is the national animal of Slovenia. There have been only about 300 sightings of it in... hold your breath... 300 Years!



□ The Texas Cave shrimp has only been found in 4 cave systems worldwide. It is an endangered species, so get a good look at it while you can!



# ROBOT

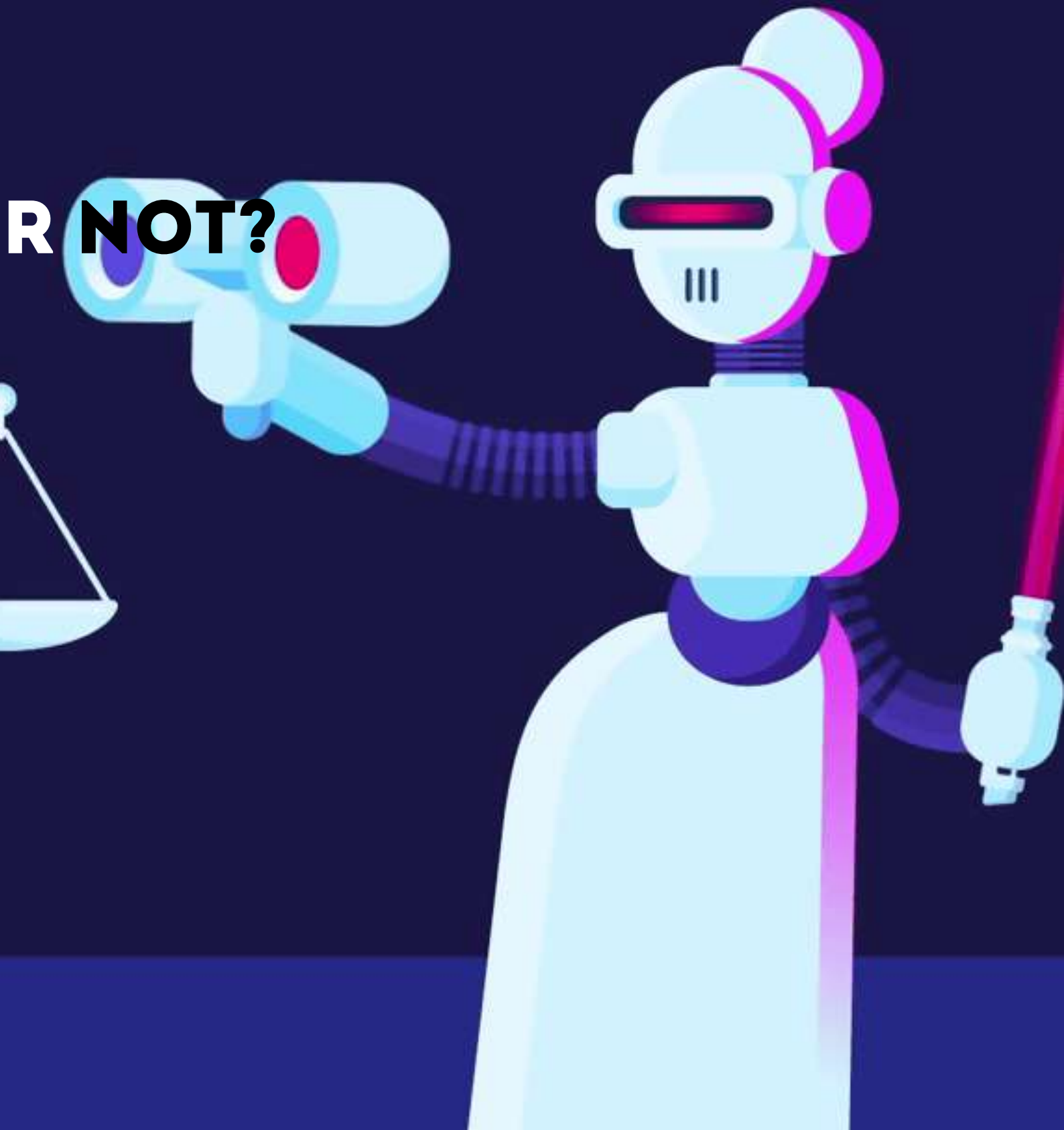


DESERVING O



# RIGHTS

**R NOT?**





Your alarm clock understands which days you prefer to get up earlier, or later, your mood about waking up at a certain point, etc. It asks you about your day and speaks to you about some cool things about clocks. It scans the internet for newer, and more updated alarm sounds during the day. If robots are considered part of our ecosystem and social system, then we would be morally obligated to protect them and harmonize them among humanity. However, they do not feel pain.

Since this is the case, what would be the difference between harming them and protecting them? We can harmonize them along with humanity for our own safety, and not make them harmful though. If they have no need for rights as of the technology we possess now, they need not be protected under our legal and ethical system. Robots certainly do help us in many ways, and damaging them even though they don't have rights is property damage (which is punishable by law) and also a waste of resources. All in all, should we destroy robots for no reason? We should not. Would you be arrested if you smash your high-tech alarm clock? No.

**Dhruv Ramu**

**Akhilesh Balaji**

Over the years, human dependency on artificial intelligence has increased greatly. Think about it: Siri, Alexa, Google Home, the automated Domino's chat-bot on the phone. Now, there are self-driving cars, robots that can sense your mood, the possibilities are endless. But, I began to wonder: Aren't we giving robots too much power in our lives? All our lives are dependent on robots!

All robots need is self-consciousness: Be made aware of how much power they have: the only thing robots lack in today's world is human emotions, but scientists are slowly getting there. But robots don't need emotion to govern a society: all they need is power, and we are giving it to them by offering them right. That is a step that humanity must never take unless it has total control over the robot's decisions and actions.



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COVER PAGE**

