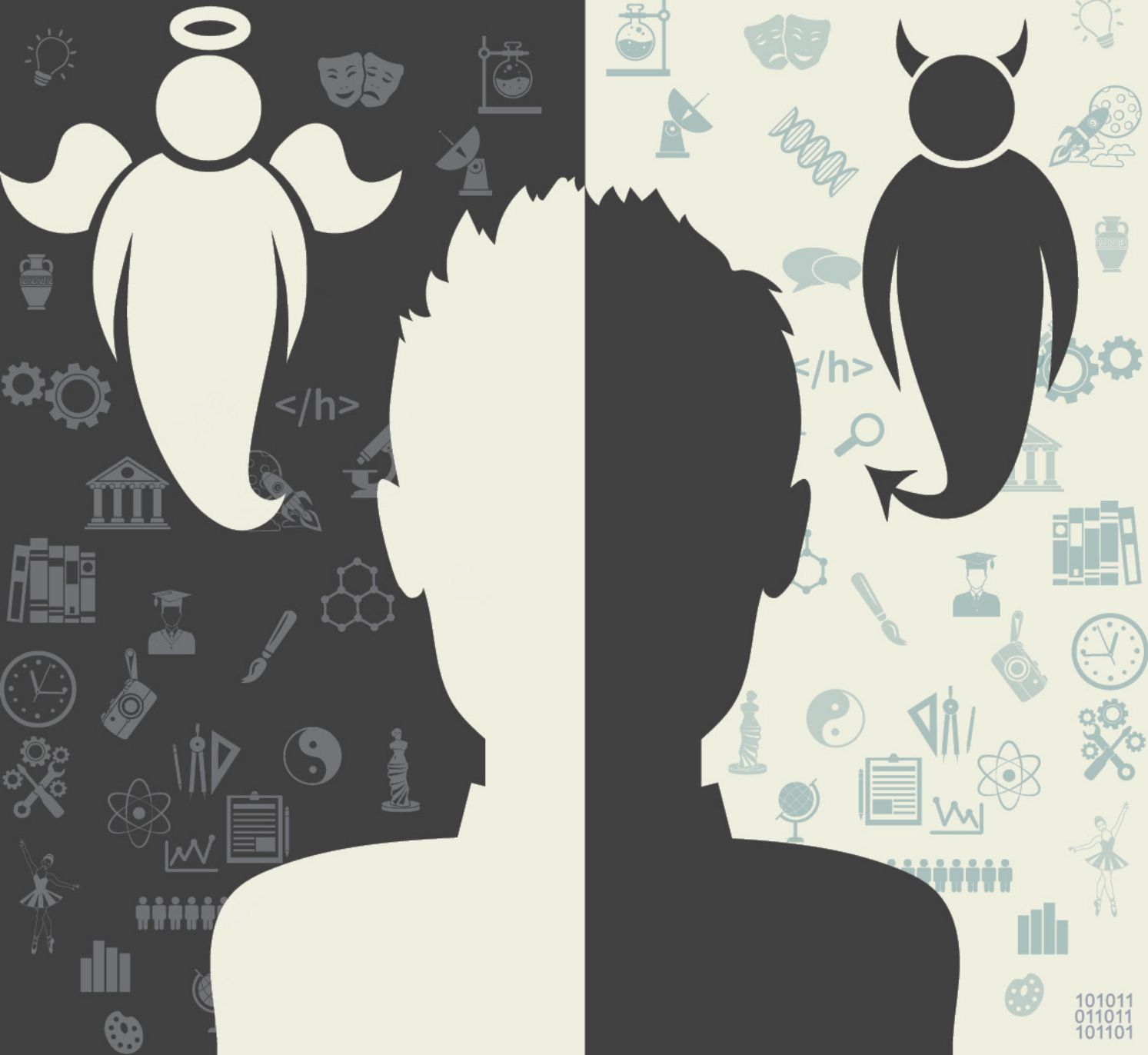


Sci planet

EYE ON SCIENCE

DUALITIES OF LIFE: Good and Evil



GOOD & EVIL

The Eternal Battle

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The Iconic Victory of Good over Evil

By: Maissa Azab

Long before 2020 began, we had decided to dedicate the year's theme to the "Dualities of Life"; it felt befitting of such a "special" year, but we had no idea how special it would turn out to be though! In the two previous issues, we tackled the dualities of Past and Future, as well as Earth and Sky, both of which are fairly tangible. In this issue, Good and Evil, as well as the next, Fact and Myth, however, we turn to trickier themes; both much more befitting of what we are going through these days, yet are the most challenging to tackle.

Indeed, the fine lines between both dualities could tip the scales of life either way in the blink of an eye. More than anything else in life, scientific discovery and invention have always been fraught with tragic, often plain destructive, misinterpretation, misrepresentation, misuse, and abuse. The reality is: science is, has always been, and will always be the main battleground for good vs. evil; both sides will continue to tug on every chance it gets to use science to gain grounds and achieve wins over the other side.

It is up to us, science communicators, to put the spotlight on this eternal war, so that the public, who could often be completely unaware of this underlying war, be alert and fight for science to always be on the people's side; all people's side, not the side of one group of people against another. As such, in this issue, we try to sift through a few examples that demonstrate how science can be employed for both the improvement of life, as well as its destruction, just to give readers an idea of a much, much greater and more profound topic.

As always, we wish you an enlightening and entertaining reading experience of this new issue of *SCIplanet* Printed. We also remind you to follow *SCIplanet* Online and social media pages on Facebook, Instagram, and Twitter, and to subscribe to our e-newsletter via the website: www.bibalex.org/sciplanet.



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Every year, we eagerly await the announcement of the finest award in the world, the Nobel Prize, which gives us a deep feeling of pride and affection for the laureates whose work “confers the greatest benefit on mankind”, and who do their best in helping people around the globe grow and thrive. However, this is only the happy ending of the story, which started very differently and was not destined to unfold this way.

By: Inas Essa



The Explosive Power of Peace

The Nobel Prize was first established in 1895, and is awarded in the fields of physics, chemistry, medicine, literature, and peace. However, like any other prestigious achievement, discovery, or innovation, the prize was born through a very dramatic story that highlights how good and peace could emerge from destruction and devastation.

Speaking of the Nobel Peace Prize, which, according to the last Will of its founder Alfred Nobel, is awarded “to the person who shall have done the most or the best work for fraternity between nations, the abolition or reduction of standing armies, and for the holding and promotion of peace congresses”, we come across the original story of the Nobel Prize, which was shaped by two major turning points that impacted Alfred Nobel deeply and were a major turning point in his work and the course of history on a wider scale.

A Peaceful Beginning

Born in 1833 in Stockholm, Sweden, Alfred Bernhard Nobel shined under strict Russian tutelage and mastered several languages, as well as chemistry, physics, poetry, and natural sciences. Afterwards, his father sent him to Paris to further his training in chemistry and engineering.

While studying in Paris, Nobel met Italian chemist Ascanio Sobrero; in 1847, the latter invented nitroglycerin; the oily, liquid explosive made by combining

glycerin with nitric acid and sulfuric acid. As it was very dangerous, unpredictable, and explosive when subjected to heat or pressure, he strongly opposed the use of nitroglycerin. On the other hand, the young Nobel became interested in finding a way to control and use nitroglycerin as a commercially usable explosive, as it had much more power than gunpowder. He later received his first Swedish patent for finding ways to prepare it in 1863.

In the following years, Nobel devoted himself to the study of explosives, especially to the safe manufacture and use of nitroglycerin. In 1863, he invented a detonator, and in 1865, he designed the blasting cap.

The Toll of Peace

The first turning point happened when the 29-year-old Nobel and his family were working hard on finding the potentials to use nitroglycerine for commercial and industrial uses, even though it was considered too unsafe to have any practical use. During experiments, a huge explosion in the family’s Swedish factory killed five people, including Nobel’s younger brother Emil. Nobel was affected dramatically by this event, so he set out to develop a safer explosive, trying to make nitroglycerin safe; but, it was not that easy. During the following early experiments, including the creation of a “blasting oil”, several deadly

explosions occurred, one of them killing 15 people when it exploded in a storeroom in San Francisco.

Finally, in 1867, Nobel patented a mixture of nitroglycerin and an absorbent substance, which produced a compound that could be shaped into short sticks that mining companies might use to blast through rock. Nobel patented this invention as “dynamite”, derived from the Greek word “*dunamis*”, or “power”; a substance easier and safer to handle than the unstable nitroglycerine. Dynamite was patented in the USA and the UK, and was used extensively in mining and the building of transport networks internationally. Railroad companies could now safely blast through mountains, opening up vast stretches of the Earth’s surface to exploration and commerce. As a result, Nobel grew fantastically wealthy.

“There is nothing in our world that cannot be misused.”

Alfred Nobel

The peaceful innovation was unfortunately embedded afterwards in a fatal context, as military authorities began using dynamite in warfare, including dynamite cannons used during the Spanish-American War; at this point, the toll of the invention became too high.

Continued on page 21

Epigenetics:

The Interplay
of
**GENES &
ENVIRONMENT**

By: Jailane Salem

Are you the way you are because of the genes you inherited or the experiences you have gone through? Are we born with a clean slate, a *Tabula rasa* as it were, and therefore who we become is mainly informed by our environment and the way we are reared; or are we born already wired and equipped with traits that will shape who we are as individuals?

Nature vs. nurture is an Ancient Greek concept. Nature has to do with an individual's inherited traits; you are pre-wired at birth with certain attributes that will determine who you will become. Whereas nature has to do with how external factors affect the development of an individual. For centuries, the debate on human development tended to focus on favoring one side or the other. Nevertheless, with the advancement of science and our ability to delve deeper into our make-up on a molecular level, it has become quite clear that both are involved in how we turn out.

Until recently, it was thought that genes are simply hereditary and static; you were born with them and your genetic traits were inherently unaffected by your environment. However, recent research in "epigenetics"—a field of study that delves into these questions—is changing that. Dr. David Moore, the author of *The Developing Genome*, states "[f]or the longest time, the nature–nurture debate has been cast as a kind of contest between genes and experiences.... What epigenetics is making

clear is that is a faulty way to think about the situation, because it is not true that genes do things independently of their contexts. Instead, genes do what they do because of the contexts that they are in. Nature and nurture are always working together to produce all of our traits".

In epigenetics, "epi" means above or on top of, which is an indicator that there is something else on the "gene"; it is an external modifier to the gene that can switch it on or off. The DNA sequence remains the same; how it is read by other cells is what changes; epigenetic changes can interfere or boost with the transcription of specific genes. This is through the attachment of chemical tags to the DNA or protein wrapped around the DNA. These chemical tags are the epigenomes, which can stop some genes from being read and in a sense switching them off, or allows some genes to be easily accessible and therefore easier to produce proteins using their codes. The creation of epigenomes is affected by many factors, including diet, medication, exercise, exposure to pollutants, or even social situations.

It was believed that epigenetic changes were not passed on from parent to child, but it has been proven that it is possible. In a study done on rats, before they were subjected to an electric shock, the rats were exposed to the odor of cherries; after a few times, the rats became stressed and fearful when they could smell the cherry odor. The offspring of those rats showed the same fear of the cherry odor even though they were not subjected to the electric shock. A change on the molecular level happened in the original rats due to their environment, this change was epigenetic in nature, and it was passed on to their offspring.

While this was a study done on rats, the implications point to the idea that epigenetic changes cannot only occur because of the environment you are in, but can also be passed on from one generation to the next. At the same time, epigenetic changes are not always permanent. In this way while genomes remain unchanged, epigenomes can change the way they are expressed, and mediate the relationship between genes and the environment. Nature and nurture, viewed from this angle, are always interrelated and at play.

While we do inherit our genes, which is beyond our control, it is clear that the epigenomes that form are affected by the way we lead our life. It is a new avenue of exploration with untapped potential; the growing field is another step science has taken in order to gain further understanding into the enigma that is human development.

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Human Chimeras:

ONE BODY, TWO INDIVIDUALS

By: Nour Hany

Normally, each person is born with one blood type and one set of DNA; but, is this always the case? Years ago, we found out that a person might actually be living with two or more sets of DNA and two blood types; in other words, there might be two or more individuals inhabiting your own body without you even knowing! This phenomenon is known as "chimera"; as strange as it may seem, it is actually true, and there are three cases in which human chimeras may exist.

samples from various parts of her body. In 2015, researchers conducted a study suggesting that almost all pregnant women experience microchimerism, by examining tissue samples from the livers, kidneys, lungs, spleens, brains, and hearts of 26 women. Some of the women had died while pregnant, while others died within one month of giving birth. What confirmed to these researchers that these cells were the fetus' not the mother's is that the presence "Y" chromosomes, which can only be found in males, in these cells and all the women were pregnant with boys.

Can a woman live with her son's fetal cells all her life? In a 2012 study, researchers examined the brains of 59 dead women to trace "Y" chromosomes from fetal cells in their brains; traces were found in 63% of these women aged 39-101. What led the researchers to conclude that the fetal cells could stay in a woman's brain for a lifetime is that the oldest woman of those examined aged 94 and had fetal cells in her brain.

Possible Signs of Chimerism

Human chimeras do not usually show physical signs of their condition. However, there are some possible physical signs that could be linked to chimerism, such as having two different skin tones, disorders of genital development, having two differently colored eyes, or patches of different color or texture of hair.

The world is full of wonders, and this condition is definitely one of those! The most exciting part of it all is that any of us might be a chimera; any of us might actually be two in one!

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You Are Your Own Twin

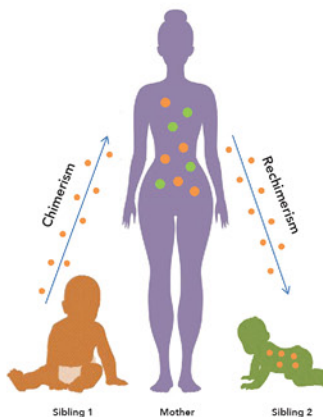
One way human chimeras can exist is when a fetus absorbs its twin. During pregnancy, if one embryo of fraternal twins dies very early, the other twin might absorb some of its cells, which means that the remaining fetus will have its set of cells, in addition to the ones from its twin.

However, these chimeras are not usually aware of their condition until they undergo a medical examination for any reason. In 2002, the story of a woman named Karen Keegan was all over the news when she needed a kidney transplant and was genetically tested to identify a matching donor among her family members, only to discover that none of her children could genetically be hers. Doctors were finally able to solve this medical mystery by concluding that Karen was a chimera and that she had one set of DNA in her blood cells and another completely different set in other tissues in her body.

Bone Marrow Transplant

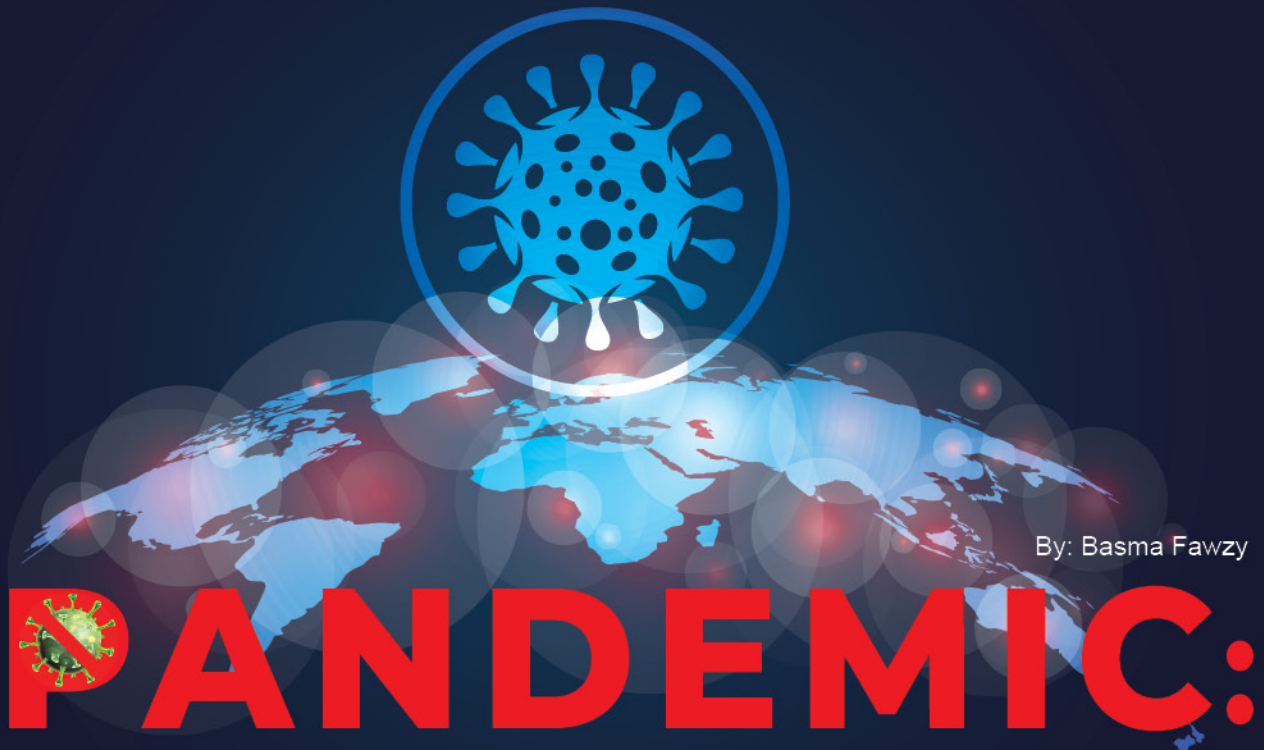
The second case a chimera may exist is when a person undergoes a bone marrow transplant; such as in the treatment of leukemia. In such cases, the bone marrow of a person will be destroyed and replaced with the donor's bone marrow. As a result, the person who receives the bone marrow transplant will have genetically identical blood cells to those of the donor, because bone marrow contains stem cells that develop into red blood cells; yet, other body cells will not be genetically the same.

Microchimerism



When a woman is pregnant, she often hears comments such as: you are now carrying a part of you, your baby needs all your care because the baby is sharing your body, your food, etc. She never thinks that she is the one who is carrying part of her baby, does she? It never occurs to her that she is actually sharing her baby's cells, and not the other way round! During pregnancy, it is very common that a small number of the fetus' cells migrate into the pregnant woman's blood, then travel to various organs. This is known as "microchimerism"; it basically means having a small fraction of your cells from someone else.

One way to make sure a woman is carrying fetal cells is by examining tissue



By: Basma Fawzy

To Predict and Prevent

In January 2020, Netflix released a documentary series entitled *Pandemic: How to Prevent an Outbreak*, coinciding with the outbreak of COVID-19. I started watching the series under the impression it was about this pandemic. As it turned out, it was filmed and produced before the coronavirus outbreak; ironically, in it, scientists were warning us of pandemics and discussing what they do every day to prevent them!

Pandemic is about the influenza viruses with all their different strains, such as the Swine flu and the Avian (Bird) flu. The series presents how doctors treat flu patients and the measures that scientists take to prevent outbreaks. These measures include vaccinating birds, tracing migratory birds, and testing them if necessary to track diseases, as well as testing bats! Testing animals is important because some viruses are of zoonotic origin; that is, they are transmitted from animals to humans.

Preventing an outbreak is of paramount importance, but once it occurs, limiting the exposure of several people to it is also important. The series discusses the Ebola outbreak and the efforts of the World Health Organization (WHO) to contain this

deadly virus, including sealing off the area of the outbreak to prevent the spread of the virus to nearby areas, because one person is enough to start a crisis.

Safety First

One of the most important measures out there to protect people from disease is vaccination. Up until today, however, creating a vaccine for some diseases is still challenging. As a result, influenza has been with us for a long time and still kills many people every year.



The series shed light on efforts by scientists in Distributed Bio, a group of researchers on a mission to create what they call “a universal vaccine”. They have been funded by the Gates Foundation so that they could make their discovery for free. So far, they have tested their findings on pigs and the results are satisfactory; still, more years of research and testing are required.

Watching the series, which was produced before the coronavirus pandemic and was just released a month after its first appearance you realize that, although the outbreak was a surprise for all of us, it was not so for the scientists. It has always been a fear and a reality to deal with; the series was a warning that came just a little too late.

Missed Signals

If you think that this series was the only warning of outbreaks, you are so mistaken. In a now-famous 2015 Ted Talk by Bill Gates, he warned that the greatest threat to humanity is something that cannot be seen by the naked eye and not an atomic war, because disease is capable of claiming far more souls than war.

If you do not believe this, check how many people died during World War I and how many died because of the Spanish flu, which broke out right after it? Bill Gates said in the Talk that Ebola, luckily, did not spread, because by the time people became quite infectious, they were unable to get out of bed, which limited their ability to walk around and infect others. He said we might not be so lucky with other diseases where people are infectious but feel fine and go about their lives normally, unwittingly spreading the disease. He gave the example of airports; does this sound familiar?



The Ted Talk of Bill Gates was not the only warning that was issued some time ago. In 2011, the movie *Contagion* warned of a nightmare similar to ours where a traveler unwittingly spreads a deadly virus everywhere. So, everyone you meet becomes your worst enemy and every surface you touch becomes a threat to your health. No wonder this movie has become so popular nowadays.

Are We There Yet?

With diseases like SARS, Ebola, and Zika emerging in recent years, the world has been forewarned. Yet, despite technological advances, the coronavirus has taught humanity an important lesson; it is like what Bill Gates said: "The next outbreak? We are not ready."

It is the 21st century and we had all thought that battling diseases that disrupt life and challenge health systems was something of the past. No one has imagined that we will witness horrors similar to those witnessed by past generations with the Cholera and the Spanish flu. The coronavirus has proven to



us that we are not ready; there are several lessons that we need to learn and pass on to future generations to ensure that pandemics can be contained efficiently in the future with minimal losses.

The Road Ahead

Human health goes way beyond health care and thinking about what we can do to improve hospitals and ensure doctors are well-trained to fight diseases, all of which is critical, but is not enough to prevent pandemics. We need to be more "vigilant"; as in *Pandemic*, there is a huge importance to testing animals. We need to ensure that sick animals do not come in contact with people; this includes keeping an eye on illegal animal trade, which was how the coronavirus started. Animals and birds also need to be regularly vaccinated; this way, we protect ourselves from zoonotic diseases.



To fight pandemics, we need to understand them, and that is not possible without "research"; what triggers certain pandemics, how they start, and how they affect people. Studying pandemics of the past can lead to more understanding of the future. Nowadays, many drugs are being tested to see if they can cure people from the coronavirus; also the BCG vaccine (Bacillus Calmette–Guérin vaccine), which protects people from tuberculosis (TB), is being tested because there are claims that BCG vaccinated people are more protected from the new coronavirus. The BCG vaccine study is still ongoing and the claims about its effectiveness with the coronavirus have neither been supported, nor refuted yet.

Throughout, "vaccination" has been a great element in maintaining human health. Due to vaccines, smallpox has been completely eradicated; polio is also almost completely non-existent. Vaccinations are the only way we can ensure that past diseases are not in our present or future. Nowadays, a vaccine for the coronavirus seems to be our only hope to return to normal.

The process of creating vaccines takes time and the challenge of creating a vaccine fast may lead to speeding up the process in the future. Will the process of creating vaccines differ in the future? Maybe, there will come a time when scientists can create vaccines for diseases that we have not yet seen. When it comes to science, the sky is the limit. Vaccines improve lives, has always done so, and there is no reason to doubt that they will continue to do so in the future.

No matter what we do, it is a fact of history that pandemics find their ways to us. So, if we do our best to prevent one and we fail, we need to be aware how to respond and "detect". Training doctors, nurses, and everyone in the healthcare system to detect and report suspicious cases, and how to deal with them in hospitals, is very important. The same applies for how to properly trace and find cases to limit the spread.

At the time of the Spanish flu, people had no way of knowing the effect of the pandemic on the whole globe. We have that information; "documenting" the whole experience nowadays is important. It will inform people of our mistakes; what we did wrong and what they could do better to avoid pandemics.

Pandemic has shown us that several scientists have warned of pandemics, but their warnings were unheeded. Will the lessons learnt from the coronavirus help us avoid the next pandemic? Only time will tell.

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VENOMS

BETWEEN KILLING AND SAVING LIVES

By: Inas Essa

How many times have you heard terrifying stories or watched horrifying scenes of a deadly spider's bite or scorpion's sting that made you jump out of your skin? No matter how many, or few, times this happened, you probably cannot detach these thoughts from your head, wishing these creatures would just disappear, leaving humans in peace. After reading this article, you may change your mind; not that you will find out that these venomous creatures are no longer dangerous, but how this killing venom can actually save people's lives from fatal diseases worldwide.

Venom is a cocktail made up of different toxins used by animals to immobilize or kill prey, or neutralize predators, by targeting the blood circulation or the communication between nerves and muscles, in self-defense or for food. Spider and scorpion venoms have evolved to disable the central nervous system of insects, while most snakes' venom targets the circulatory system of vertebrates, which results in uncontrolled bleeding and organ failure.

Well, this is a part of the story; now, let us have a look at how this same venom could be used for the benefit of humanity.

Venom-based Medicine

By showing potential in pain relief and the prevention of blood clots, and other therapeutic benefits in treating diseases, the field of venom-based medicine has evolved and flourished over the years. As soon as scientists realized that venomous toxins target vital body parts with extreme precision and potency, they have been trying to go further with their experiments and search for potent drugs that could emerge from highly evolved venoms for a wide range of conditions.

Over the years, researchers have tirelessly worked to extract drugs that have been used as treatments for many diseases; from cardiovascular diseases, diabetes, and chronic pain, to autoimmune diseases, cancer, and HIV. Indeed, it is not an easy process; it is an arduous one that requires numerous trials with a risk to the researchers themselves of getting bitten or stung along the way.

Scientists extracted drugs from venoms that contain hundreds of different bioactive elements, which interact with each other producing its toxic effects. This mixture of ingredients includes various proteins,

peptides, and non-peptide small molecules. Then, they isolate, purify, and screen the active components of these venoms in assays, either to identify components that may have desirable therapeutic properties, or target-directed assays to identify their biological target and mechanism of action. In this way, toxic venomous poisons may be a starting point for a therapeutic drug.

The Animal, the Venom, and the Drug

1. Snakes

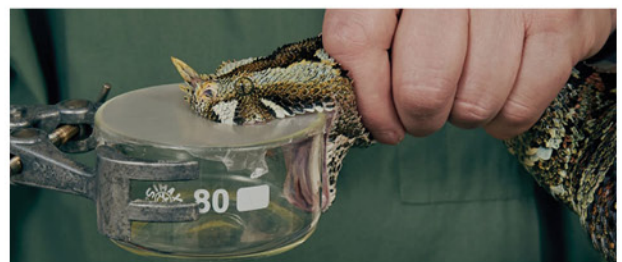
According to Dr. Zoltan Takacs, founder of the World Toxins Bank Project, "Snake venoms served as templates for some of the top medicines used in high blood pressure, heart failure, and heart attack".

Snakes are probably the most studied among scientists in search of new drugs. Most of them deliver their poison through fangs that operate in a similar method to a syringe. Once the fang has pierced their victim's flesh, the poison is delivered through the tooth and directly into the prey's bloodstream.

Snake venom covers a wide array of different venoms; the thing that opens the door to different medical applications that differ from snake to another. Yet, many drugs derived from snake venom target the cardiovascular system.

With a close look at pit viper snakes *Bothrops jararaca*, researchers realized that its bite leads to a severe drop in blood pressure. The drug, Captopril, based on it to treat hypertension, was generally accepted as the first venom "success" story and was approved by the FDA in 1981. The drug works by stopping the molecules that would ordinarily prevent blood vessel dilation, allowing them to widen and lower blood pressure.

Another snake species, the southeastern Pygmy Rattlesnake, which lives in the United States, has potent venom that stops the blood from clotting and causes profuse bleeding. The Eptifibatide drug is extracted from this venom and is used for treating patients who are at risk of sudden heart attacks and strokes, as it prevents blood clotting by stopping platelets in the blood from sticking together.



2. Scorpions and Spiders

The death-stalker scorpion's potent venom, which contains a toxin known as *Chlorotoxin*, could play an important role in diagnosing cancer and in delivery systems for treating tumors. It is useful in marking up brain tumor cells during surgery, because it is not that easy for surgeons to identify where a tumor ends and healthy cells begin.

Chlorotoxin binds to tumor cells; by adding a fluorescent tag, tumors "light up", allowing a surgeon to see their boundaries. This "tumor paint", developed by researchers at the Fred Hutchinson Cancer Research Center in the USA; has been tested in animals to find its way to humans.

Spider venom also appears to be a rich source of compounds for drugs development, as their toxins have the potential to variously treat muscular dystrophy, chronic pain, and erectile dysfunction.



3. Cone Snails

Found in the warm Indian and Pacific Oceans, carnivorous sea-snails' venoms are proven to be useful as painkillers. With their complex and potent venoms, scientists could develop a morphine-like drug, derived from the Ziconotide agent found in the snails' venom; it is used to treat severe chronic pain.

For the prey, the deadly bite of a modified tooth that is projected out of the snail's mouth instantly paralyzes it. Once immobilized, the prey can be engulfed and digested by the snail. These same toxins have shown painkilling effects in humans and are used to treat severe chronic pain by administering it directly into the spinal fluid.

Researchers at the University of Utah also found that another snail toxin can affect nicotinic receptors in the brain. This gives a green light to develop treatments for tobacco addiction, Alzheimer's disease, Parkinson's disease, schizophrenia, and lung cancer.



4. Sea Anemones

On one hand, the sea anemone uses stinging cells in its tentacles to deliver venom to its prey just before shoveling them into its mouth. On the other hand, their venom brings good news to patients who suffer from autoimmune diseases.

Researchers have been conducting experiments on anemone venom peptides, that show promising compound, forms the basis of an experimental drug called Dalazatide. This drug is ready to undergo phase II clinical trials for treating autoimmune disease. What makes

this drug stand out from others is that, instead of suppressing the whole immune system, it very selectively blocks an ion channel in the particular type of immune cells that go haywire in autoimmune diseases, such as multiple sclerosis, rheumatoid arthritis, psoriasis, and lupus.



5. Lizards

The Gila monster is one of the very few species of venomous lizards that has venomous saliva. It is found in the United States and Mexico, and is the source of exenatide; a drug used to treat Type 2 diabetes and also in losing weight. It can keep their blood sugar stable with an unusual ability to eat as little as three big meals a year. Researchers found a component in the lizard's venom that mimics the activity of a human hormone that stimulates insulin release when blood sugar levels rise.



Not an easy process, yet efficient

To date, seven drugs derived from animal venom have been approved by the FDA to treat conditions ranging from hypertension and other heart conditions to chronic pain and diabetes. It is neither an easy, nor a smooth process to develop toxin-derived drugs. Like other drugs, it takes many years from initial discovery to marketing, and many projects fail along the way in the clinical phase due to the lack of efficacy or adverse reactions. However, with modern protein and sequencing technology, this number is hopefully growing.

"It takes seven to twenty-five years to develop a drug once you identify a toxin," says Dr. Zoltan Takacs. "People are always going to get sick, so you need new cures ... snakes and other creatures can give you this life-saving medicine," he adds.

Venoms can take a life in a minute; yet, they can save many lives as well, help patients get a better life. With the ready treatments already on the markets, there are still many others that are being tested in laboratories to be approved for use by humans.

The stories about deadly killer spiders and scorpions are not based completely on illusions; they are real indeed, but they do not tell the whole truth. These unique creatures can also ease the pain and treat the ailments of millions, saving their lives and giving them a better life.

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Organic and Inorganic Food

By: Shaimaa Zakour

Everyone is seeking to reach perfect health; however, it seems hard to achieve with so much contradicting information in the world of nutrition. In light of this contradiction, we find many people confused between choosing organic and traditional food; some think organic food is healthier, safer, and tastier than inorganic food, but others prefer normal traditional products.

How can we differentiate between organic and inorganic food?

Organic production is based on working in alignment with nature by maintaining the natural habits of plants, animals, and wildlife, as well as avoiding the use of man-made chemicals, such as fertilizers, pesticides, antibiotics, and Genetically Modified Organisms (GMO). It all aims to improve the soil's quality, maintain aquifers, reduce pollution, and promote biodiversity; it might be the best approach towards an environmentally, socially, and economically sustainable production.

From another perspective, some reports indicate that there are additional quantities of vitamins, minerals, antioxidants, and omega-3, in addition to less traces of pesticides, nitrates, and heavy minerals in organic crops, compared to their counterparts in inorganic products. Moreover, some recently conducted studies on animals have shown the importance of organic food when it comes to growth, breeding, and the immune system.

Organic foods come in all forms and sizes; they are not limited to fruits, vegetables, dairy products, and meat. You can now easily get them as fast foods, snacks, and other high-calorie processed foods, sugar, salt, and additive fat that is not healthy and not much better than their traditional counterparts. Overall, for a product to be organic, it has to be free of all artificial additives, including sweeteners, preservatives, as well as artificial coloring and flavors.

Price is one of the drawbacks of organic food, as it tends to be more expensive than

inorganic counterparts; this is because it is difficult to obtain it directly from farms or producers. It could also be affected by the variety of products, seasons, and product-trading methods; this steers those with limited budgets towards buying inexpensive traditional products.

How can you tell if what you are buying is an organic product?

The United States Department of Agriculture (USDA) launched a program to issue organic certificates; it includes subjecting all foods to meet strict governmental criteria before being classified as organic products. If you want to buy organic products, it is crucial for you to look for the USDA organic stamp; look for these phrases on food stickers to recognize organic foods:

- 100% Organic: The product is completely made of organic components.
- Organic: At least 95% of the product's components is organic.
- Made with Organic Ingredients: At least 70% of the product's components is organic.
- Inorganic: The product contains less than 70% of organic components, and the USDA stamp cannot be put on it.

Choosing organic food lowers your risk of being vulnerable to toxins, pesticide remains, and antibiotic-resistant bacteria; however, levels of toxins in traditional products in general are lower than the safety limits. There is not enough strong evidence indicating great health benefits of organic foods compared to inorganic foods. Organic foods are not necessarily all healthy; it depends on the consumer's choice of food based on their respective reasons, desires, and personal preferences. However, you should always keep in mind that, whether you choose organic or inorganic food, you can still find healthy food in many products, such as vegetables, fresh fruits, whole grains, beans, eggs, lean meat, and low-fat milk.

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While you are relaxing on your couch and scrolling down your social media accounts, you came across a picture of someone whose charming look and slim body shape you admire; your eyes capture the perfect picture, you hit "like" and keep browsing. Do you think the impact of this picture has ended at this point? If your answer is "Yes", then you have to think again.

Needless to say, social media has created a fertile environment for interactions and engagement, and has allowed people to share moments of their life with others. However, we should peel away this glamorous surface and dig under the surface that hides an alarming aspect of this glittery story, which could harm youth mental health seriously.

Besides the mentioned role, social media has also set standards, sometimes unrealistic, regarding lifestyle, look, body image, habits, success, etc. These standards do not only stop at being displayed on homepages; they compose a kind of hidden pressure that can take its toll on you and make you unconsciously conform to them. The picture you have just liked could have a long-lasting effect on your mental health due to the comparison you hold between yourself and what you conceive as the "perfect" picture.

This comparison can promote increased body image concerns in youth who struggle to cope with the standards they are exposed to through social media. As a result, trying to obtain this perfect

Living in Social Media and LIFE-THREATENING DISORDERS!

By: Inas Essa

body may lead to two of the main eating disorders linked to mental health: Anorexia nervosa and Bulimia nervosa.

Anorexia nervosa

It is a serious psychological condition and a potentially life-threatening eating disorder that commonly involves emotional challenges, an unrealistic body image, in addition to an exaggerated fear of becoming overweight or obese. It is considered the third most common chronic illness among teens.

People with anorexia restrict the amount of food and calorie intake; they tend to vomit after eating or misuse laxatives. It does not stop at a certain point; they continue trying to lose weight out of fear of weight gain, even if they reach a very low weight.

Symptoms are divided between physical and behavioral. Physical symptoms can be evident in a very low Body Mass Index (BMI), dry or yellowish skin, and bluish discoloration of the fingers, thinning hair, absence of menstruation, dehydration, and intolerance of cold. Behavioral signs include restricting food intake, frequently skipping meals, exercising excessively, overusing laxatives, vomiting, avoiding to eat in public, repeated weighing, social withdrawal, and irritability.

Complications resulting from this behavior could be alarming since the lack of nutrients may cause:

- Cardiovascular problems such as low heart rate and blood pressure;
- Higher risk of developing leukopenia, or low white blood cell count, and anemia;
- Gastrointestinal problems, such as constipation, bloating, or nausea;

- Lower levels of growth hormones that may lead to delayed growth during adolescence;
- Loss of muscle and bone fractures due to osteoporosis;
- Kidney problems resulting from dehydration.

On the mental health scale, people with anorexia commonly suffer from other mental health disorders: depression, anxiety, difficulty handling stress, being excessively worried or afraid, being a perfectionist and overly concerned about rules, having a high level of emotional restraint or control over their own behavior and expression.

Bulimia nervosa

It is a serious mental illness and eating disorder characterized by a cycle of excessive overeating (binging) followed by vomiting to undo the effect of eating. Unlike anorexia, people with bulimia can be overweight or obese and they use purging to manage their weight.

The physical signs can be evident in fluctuations in weight, stomach cramps, muscle weakness, unusual swelling of the cheeks or jaw, difficulty concentrating, sleep problems, feeling cold all the time, poor wound healing, and impaired immune functioning. Binging and purging, fear of eating in public, extreme mood swings, extreme concern with body weight and shape, and drinking excessive amounts of water are the most common behavioral signs.

Complications of these behaviors can be very serious, starting with the purging and binging that put severe stress on the body and heart, causing arrhythmia and heart attacks. Chronic stomach problems

are also complications of bulimia, such as chronic gastric reflux and gastroparesis; also, repeated vomiting can lead to rapid tooth decay and yellowish teeth. Moreover, fertility problems could occur.

Not perfect, only filtered

The good news is that both of these diseases can be treated through hospitalization and counseling; the patient may need to go through a cycle of psychotherapy treatment, family-based and individual. However, in order not to reach this point, we should believe that we are all different in look, body shape, way of thinking, and so many other things; that is what makes every one of us unique. By trying to listen to our inner voice and build an honest sense of self, we would be able to reach a safe shore of our own, away from all these filtered messages that try to show us that there is only one way of beauty.

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**BEST OF THE
2000s**



SOCIAL MEDIA: The Good, the Bad, and the Trending

By: Esraa Ali

“Oh dear, you are not on Facebook!” is a common comment I have been getting for three years now—since I have deactivated my account—whenever I ask about a trend I am not familiar with in any gathering. I do miss my social media life, especially in such dreadful times when in-person human interaction is limited. Social media has become a way, or rather the only way, for entertainment and interaction with your buddies; yet, it is not all bright and shiny.

No one can deny that the invention of online networking is one of the greatest inventions of the 2000s. The history of social media is definitely linked to the invention and widespread of the Internet, since it is based on online communication. With that in mind, we realize that social media platforms are a wide range of things that include: the social network Facebook, the microblogging service Twitter, the messaging application WhatsApp, and the video-sharing site YouTube, among many others nowadays.

In a world where more people own a mobile device than a toothbrush, social media is certainly a big world. It has become an integral part of all of our lives, and everyone uses it a bit differently; we use it to connect with friends and family, look for jobs, entertain ourselves, and get updated with current events. In 2020, an estimated 3.6 billion active users globally use social networking sites; a number projected to increase to almost 4.41 billion in 2025.

Since the dawn of time, we know by heart that whenever there is a significant technological advance, people’s lives change dramatically, and a debate arises about its nature; is it good or bad? In a relatively short time, social media platforms came into existence; they have since revolutionized the way we communicate, and became one of the most important tools for empowering people.

At the same time, they have fostered unhealthy and destructive behaviors that have made a lot of people call it “a curse!” to confront those praising “the power of social media”.

With good intentions, social media primarily emerged to nurture and expand our relationships; regardless of your location on this planet, you can find other people, who share the same interests. It also has proven effects on mental health support; research shows that people who get online support from others struggling with the same problems, have better health outcomes than those who might not seek help. Here lies the beauty of social media as a connectivity tool; you can connect with anyone to share your thoughts and learn too.

Social media offers more information than you might find in a library, and you can access it at any time. I remember that, working on my Master’s dissertation, I built a lot of culturally specific ideas from social media navigation. You can easily learn too from experts and professionals in any field via social media, by simply following them to enhance your knowledge. Regardless of your location and educational background, you can educate yourself for free!

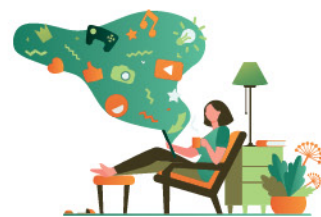
For teachers as well, social media has lots of benefits; it is very easy to reach out for students using its various tools instead of traditional educational methods. Whether they connect on Zoom or upload videos on Facebook, teachers no longer find these tools intimidating. In addition, they are no longer limited to their classroom students; they can reach out for other kids from all over the region with the videos they have created. Teachers are now out of their comfort zone and use other challenging tools that lead to incorporating “blended learning”—a combination of technology resources and in-classroom learning—into today’s educational systems.

Similarly, studies have linked social media use with greater success in people’s careers. The whole world became open for businessmen and entrepreneurs; they can make their businesses profitable and less expensive by promoting it to the right audience everywhere, using minimal fees for advertising. Another fine reason that makes social media a blessing is its role in building communities; it provides an area for discussion that involves people from different backgrounds, helps the needy through quick and innovative ways, creates awareness, and enhances people’s lives.

However, what makes social media unique and of positive effects on our lives, could make it worse too. Cyberbullying has become one of the most potentially dangerous problems on social media, especially for teens. Social media allows the creation of unlimited accounts that could be fake, and those with bad intentions could use it quite easily to bully without being traced. They could threaten and intimidate others, or spread rumors that create discomfort in the society.

Stalking is another issue that faces social media users; they post a lot of information about their lives and habits that can be easily monitored. Hacking and identity theft are other consequences of sharing personal data, which can be easily accessed and hacked. This could lead to business losses and affect individual’s personal lives and reputations. Moreover, as users share their happy moments and successes, it could make other people with self-esteem issues and insecurities unintentionally measure their success on them, thus, deepening feelings of inferiority and failure.

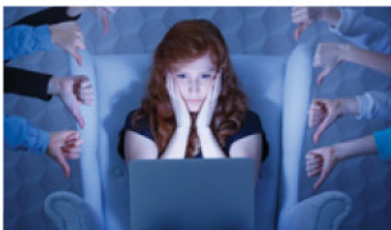
Social media does not only have connective powers, it has destructive



ones too. It could connect misguided people together and fuel their negative attitudes and beliefs, leading to disastrous actions that harm a lot of innocent people. Moreover, the nature of social media as a user-generated content that everyone can post without significant restrictions on the type of the uploaded content, and its viral nature of content distribution, allows false and unreliable information to spread quickly.

Statistics have shown that the average Internet user spends nearly 26% of their year online. Most adults remember what life looked like before social media, and they can step away from it, but young people can hardly do so, leading to another potentially dangerous issue “social media addiction”.

Scientists are unveiling increasing links between the excess use of social media and teen depression. Young people who already feel unhappy and isolated are cut off from the society and becoming vulnerable. They seek online experiences to escape the reality and to feel connected, but this makes their depression and anxiety worse. They get into a “never-ending addictive loop”—as described by psychologist and writer Nicholas Kardaras—and spend excessive time social networking for more, regardless of their emotional response.



Whether social media is “good” or “bad”, a blessing or a curse, each view has more than one evidence to support its argument, but research on social media effects is still in its infancy with relatively scarce scientific data. What is clear is that what happens on social media, never stays on social media, but affects our communities and societies as a whole. It is important to understand, and help others understand, and be social media responsible. Remember to make the correct choices in the correct time with the correct amounts, to keep everyone safe, healthy, and satisfied.

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Good or Evil: You Judge!

By: Maissa Azab

With a constant desire to learn and do so many different things personally and professionally, I am always reading and watching material about productivity. In one of the online courses I recently took on the subject, I was introduced for the first time to the concept of “brainwave entrainment”, which the course’s instructor—a very successful writer—was strongly advocating for, affirming that it was one of her essential go-to hacks to stay focused and productive.

Intrigued by the sworn-by potential to help boost my focus and productivity, I immediately started searching for brainwave entrainment applications. The fact that I was driven by an online tip to dive right into something I knew nothing about is the first thing I warn you about; do not follow in my footsteps! Luckily, as soon as I started searching, I came across some alarming warnings. This got me researching this hack I was so eager to try without knowing what it actually is.

When I heard how brainwave entrainment was described in the course, I understood that it is basically some kind of special music, which is sort of true. However, Brainwave Entrainment, also known as BWE, is actually a method to stimulate the brain into entering a specific state by using a pulsing sound, light, or electromagnetic field. The pulses elicit the brain’s “frequency following” response, encouraging the brainwaves

to align to the frequency of a given beat. Sounds freaky, right? Well, let us not get too dramatic and judge too quickly again!

BWE is nothing new; ceremonial chambers acoustically tuned to specific brainwave frequencies have been found dating back to the Bronze Age, and the ancient Greeks used flickering sunlight shining through a spinning wheel to induce altered states. Since the 1970s, a wealth of brainwave entrainment techniques has developed using digitally encoded audio beats, strobe lights, or low-energy electromagnetic fields.

BWE is marketed with promises of increasing IQ, promoting weight loss, enhancing creativity, concentration, inducing spiritual states, and more. While these claims are not entirely true, they are not altogether false either. In practice, the claims are based on an overly simplistic view of how the brain and the brainwaves function.



It is believed that patterns of neural firing, measured in Hz, correspond with states of alertness, such as focused attention, deep sleep, etc. It is hypothesized that, by listening to these beats of certain frequencies, one can induce a desired state of consciousness that corresponds with specific neural activity such as studying, sleeping, exercising, meditating, doing creative work, and so on.

People are seldom deficient in a certain brainwave type in all areas of their brain; however, we are all different when it comes to the distribution of our brainwaves. As such, boosting a certain brainwave state may be beneficial for one person, and emotionally uncomfortable for another; without knowing each person's starting position, entrainment can be rather "hit or miss".

If brainwave entrainment leaves you with unwanted side-effects or discomfort, you are probably encouraging a range of brainwaves that are already excessive in some area of your brain. The way around this is to get a brain map to see what your brain's strengths and weaknesses are, and see what, if any, brainwaves could use some encouragement.

At this point in my research, things started getting worrisome. Users are warned not to use brainwave entrainment if they are prone to seizures. Extra caution is required for those under 26 years of age, as the brain is still developing and is more sensitive. There are some general guidelines to help limit the risk of discomfort, which I am listing below as I found them:

- Do not overdo it. Most cases of side-effects are after overuse. A

15-minute session is sufficient to begin, or 3–5 minutes if using audio/visual entrainment. Everyone reacts differently, and you will need to determine your sensitivity before jumping in.

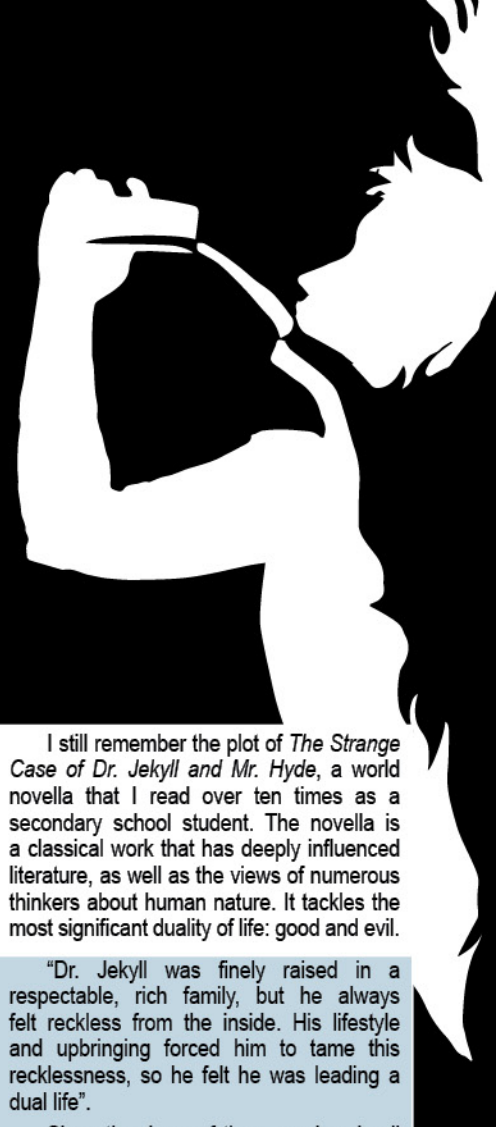
- If you experience increased anxiety, convulsions, overwhelming subconscious images, nausea, headaches, dizziness, or increased heartbeat, discontinue use immediately and permanently.
- Do not use brainwave entrainment if you have any brainwave hyper-arousal or instability symptoms.

The warnings do sound daunting. I personally was put off and have eventually decided not to try brainwave entrainment. Still, I have to say that, from what I read, it seems that most people do not experience ill-effects from brainwave entrainment. The most common side-effect is simply feeling a little unusual for a while. If a user happens to experience any unwanted effects, they are advised to discontinue use and give it a few days to return to normal. Whether BWE is good or evil; as far as I can tell, it is up to each person to judge for their selves.

In an overwhelming era of constant virtual and online immersion, we find ourselves exposed to loads of new information and bombarded with technological options that could be either really good for us or completely the opposite. Thus, we need to be cautious with the information we believe and act on, as well as with the use of new technologies. We need to assess everything carefully and research it using reliable sources before making any decisions that could affect us, whether physically or psychologically.

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I still remember the plot of *The Strange Case of Dr. Jekyll and Mr. Hyde*, a world novella that I read over ten times as a secondary school student. The novella is a classical work that has deeply influenced literature, as well as the views of numerous thinkers about human nature. It tackles the most significant duality of life: good and evil.

"Dr. Jekyll was finely raised in a respectable, rich family, but he always felt reckless from the inside. His lifestyle and upbringing forced him to tame this recklessness, so he felt he was leading a dual life".

Since the dawn of time, good and evil have been in a constant war against each other, with victory bouncing from one side to the other. Deep inside, however, we believe that good will eventually prevail; this belief is inspired by movies, novels, and religious convictions. A corrupt man who steals from the poor should eventually be punished, while a courageous hero who rescues innocent people should eventually be rewarded; yet, do any of us know what "eventually" refers to exactly?

The constant war between good and evil might have been obvious before because each side manifested itself in an independent being; but, what if both are manifested by a single entity or person?

"Dr. Jekyll thinks that a human might not be one being, but two, or maybe more. He, thus, develops a medicinal formula to separate the two beings inside himself; as a result, Mr. Hyde emerges".

The Human Psyche

Psychiatrist Jihan Abdel-Hamid, a member of the American Psychiatric Association, explains that the human psyche is structured into three parts: the id, ego, and superego.



Dr. Jekyll

By: Fatma Asiel

and Mr. Hyde:

Good and Evil in the Human Nature

The id is the earthly, primitive and instinctual, part of the psyche, which can be “virtually” described as evil. It is what urges one to do the things s/he desires to do regardless of its legitimacy; for example, one might desire to take over a valuable thing because s/he needs money. Conscience is the element that tames desires, urging us not to take over what is not ours.

Here comes the role of the ego; to regulate the relationship between desire and conscience, to avoid conflict. If the conscience wins all the time, it would continuously reprove the person, and s/he might become compulsively obsessive. If the ego wins all the time, a person would become wanton, irrepressibly wreaking havoc.

“The unpleasant, scrawny Mr. Hyde emerged, walking the streets at night, causing problems, committing crimes, and finding pleasure in harming others. Jekyll’s conscience tortured him for Hyde’s deeds, but these same deeds satisfied something inside him”.

The Social Impact of Early Age on the Human Psyche

Psychiatrist Jennifer Konst indicated that many people who suffered in the early stages of their lives, specifically as children, from negligence, poverty, or mistreatment, fight to overcome these obstacles, putting forward their best, which reflects on their life choices. On the other hand, some people receive the best quality care and attention; yet, their life choices go from bad to worse.

Dr. Konst asserts that we are all born with an instinctive rejection of good and an evil motive for destruction, corruption, and revenge; yet, she also believes that everyone carries the seeds of good, which can grow into love, care, and help.

The scientific reasons behind human motives

Everything that has an impact on the human psyche is represented by brain chemicals. It is natural for one to feel happy when s/he sees a pleasant natural landscape, hears kind words, or eats a delicious meal. This happens due to the fact that all external factors stimulate the secretion of serotonin, the hormone responsible for feeling happy. On the contrary, serotonin secretion decreases when one experiences moments of weakness or failure, and therefore, feels down or sad.

Dopamine, on the other hand, is a hormone and a neurotransmitter at the same time; it is produced in two regions of the brain. The dopamine produced in the first region is responsible for movement; the dopamine produced in the second region—with which we are concerned—is responsible for feeling rewarded, victorious, and happy. These are the feelings that we experience when we get something done, pass an exam, or eat some chocolate; they are also the feelings experienced by those who satisfy their “evil” desires through beating, killing, or stealing. The way the brain satisfies its need for dopamine differs from one person to another; it could be through either good and legitimate deeds or illegitimate, evil ones.

“As Hyde’s persona grew, gaining power, Jekyll chose to give up the evil inside himself, fearing that it would engulf him. He did not drink his formula for two whole months, but he kept thinking of going back to it”.

Beyond Good and Evil

Dr. Travis Langley stated that good and evil are much deeper than white and black, quoting Friedrich Nietzsche, the philosopher

who revolutionized the traditional notions of good and evil in his book *Beyond Good and Evil: Prelude to a Philosophy of the Future* (1886).

In his opinion, Dr. Langley thinks it is harder nowadays to distinguish good people (heroes) from evil people (villains) than it was in the past; flaws are evident in heroes, as are humane aspects in some villains. All humans—including the heroes of ancient myths—have weak points, such as failure, jealousy, malice, and lust for revenge. Even mythological heroes fought with each other; what is good in that?

Sometimes, we put aside the good inside when it goes against our feelings, ambitions, or interests; it is, thus, normal to find heroes fighting each other in pursuit of gain or even the admiration of the public, for example.

“In a moment of weakness, Jekyll drank the formula again, and it became too difficult to control the evil inside. It was inevitable for him to put an end to his life, killing both Dr. Jekyll and Mr. Hyde”.

White and black no longer symbolize good and evil; there is a grey area in-between, indicating the potential of having both in our nature. The conflict between good and evil will last until the end of time, and they will continue to exchange victory; however, it is always important that good wins at the end.

*The Arabic version of this article was developed as part of the Goethe-Institut science journalism project “Science Storytelling”; the project is supported by the German Federal Foreign Office.

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By: Maissa Azab

THE DARK SIDE OF ART

We have often tackled the intricate relationship between science and art, usually focusing on the many ways art contributes to the betterment of science and science communication, in addition to its potent therapeutic role in some cases. This time, however, I want to take a glimpse with you on a different angle: Can art be evil?

To an artist, everything in the world is potentially a source of beauty, creativity, renewal. In a very real sense, artists do not think of the world in terms of good and evil, but more in terms of “What can we make of this?”

Most people believe the purpose of art is either inspiring and ennobling the human spirit or being a vehicle of self-expression for the artist. In reality, these are not mutually exclusive; however, the one that is the main purpose of an artist’s work greatly affects his/her art philosophy. Those who see art mainly as self-expression often believe there is no right or wrong in it; to decide whether we agree or not, there are different aspects to consider.

Evil is what evil does!

Benvenuto Cellini’s bronze sculpture of Perseus, made in 1548, shows the hero casually trampling over the sprawling corpse of a decapitated Medusa, flaunting a blade in one hand, and dangling her

head from the other. For more than 400 years, Cellini’s triumphant *Perseus with the Head of Medusa* has been displayed in all its glory in the Piazza della Signoria, adjacent to the Uffizi Gallery in Florence. The sculpture is a brilliant expression of a reckless indifference to violence, the manifestation of which was unfortunately not contained by the artwork, but extended to horrendously manifest in the artist’s own behavior.

Throughout his life, Cellini faced multiple accusations of rape; a notorious brawler with a violent temper, he was implicated in three counts of murder, one of which he recorded with great relish in his much-admired autobiography. Yet, posterity has been kind, remembering him as a master goldsmith, accomplished musician, and an exuberant soldier—the model Renaissance man.

When the German philosopher Immanuel Kant described the conditions by which we evaluate the beauty of “an object or a kind of representation” in his aesthetic treatise of 1790, *The Critique of Judgement*, he stipulated the essential quality of “disinterestedness”. This attitude permits us to assess work without the influence of an internal agenda or external interference—a requirement, in other words, that we understand a work of art purely on its own terms, unmarred by historical, political, social, or moral implication. If Kant were alive today, he

would argue that only the work matters, not the person behind it or their deeds.

I believe this can be true for artists like Cellini who lived centuries ago, during a time when information did not spread wide and is now a tiny part of history that most people who admire his work would not know anything about. However, when it comes to more modern artists, the likes of Pablo Picasso and Alfred Hitchcock for example, how can we easily admire their work when we know that the first was serially unfaithful to the women he was in committed relationships with, and the second famously terrorized the actresses playing in his movies?

Beauty and the Beast

Some artworks could be conceived as evil in disguise and debasing of human morality. Do such works serve some merit in exploring human psychology and social dynamics, and thus, be accepted as such? There are three theories in this regard:

Separatism suggests we can find art that depicts unethical and even outright evil messages as beautiful, while still finding its meaning awful, shameful, and wrong. Separatists do not think we recognize and process beauty and morality together as one; our brains see the two as separate. I may think a work of art is awful and appalling, but still enjoy its aesthetic beauty and originality of design.



The movie *Natural Born Killers* is essentially about two psychopaths on a killing spree, doubling as a romance. It glorifies and romanticizes murder in a very engaging way, making it look hyper exciting, while the lead characters intimate bond becomes closer as they rampage through America. The movie is shot extremely well, the storyline is highly interesting, and the special effects are used with animated versions of the characters themselves is fascinating.

Most people love this movie, but still realize how evil the characters are, and how innocent lives being lost is about the most tragic and awful thing to happen. What is being shown on screen is dark, twisted, and completely insane, but the movie is very entertaining. Separatists would say it is normal for a person to like this movie; we love the creativity and artwork, but we still view it as morally reprehensible. We are judging these two parts of the movie as being totally separate from one another.

Moralism suggests that no form of unethical art is truly art; the exact opposite of separatism, it views ethic and morality as one and the same as aesthetic quality and beauty. Even if it is an extremely beautiful work of art that is uniquely and skillfully crafted, if it depicts something unethical or immoral, it is not art, because its meaning and message are not beautiful.



Eminem sells millions of records and has a massive fanbase. Many of his songs are unique, creative, interesting, and downright entertaining, but the message contained in the music can be quite violent. His lyrics are extremely profane, and he does not care who he offends or how far he goes. Moralism would suggest that these songs cannot be enjoyable, entertaining, or amusing, because of their immoral and hateful content.

Ethicism bridges the gap between separatism and moralism, taking a middle stance between the other two theories; it states that unethical art can still be a good form of art.

For example, *A Few Good Men* is a movie all about ethics, where the protagonist gets two innocent men freed and exposes a man who ordered them to do an ethical act. Ethicist would say this is a great movie, because not only did it have great aesthetic quality, but it was also an ethical movie; this sense of ethical righteousness made this movie a better movie by ethicist standards. On the



other hand, ethicist would suggest that Eminem's lyrical content would make his music worse music than it could be, but still a good work of art. This point of view is a lesser extreme between the two other theories I have mentioned.

The Eternal Question

It is in human nature to have emotions; irrational, uncontrolled, and unrestrained emotions. We cannot pretend we do not have them and pretend to be morally superior to everyone else. When we get angry, we may imagine punching or attacking the person we are mad at; later on, we rethink our anger, contemplate, and reach more rational conclusions. We think politically incorrect things, we have prejudices and biases, which most of us recognize as wrong and irrational; that does not mean that subconsciously those unethical feelings and attitudes are not there.

Works of art allow for an outlet within oneself for immoral thoughts and allows one to question their own ethical codes by presenting new ideas that are not candidly discussed. The reason people like them is because they are immoral; it is the same reason many enjoy violent video games. Not because they are sick people waiting to have a violent outbreak, but because they are human. We all have a dark side to our subconscious mind, and it is interesting when we use our dark urges to create something crazy, yet cathartic.

Art is an expression of honesty from one's soul open for all to see and be exposed to. If an artist censors themselves, how can we ever deal with evil in the world? How can we progress without people being able to question the way things are?

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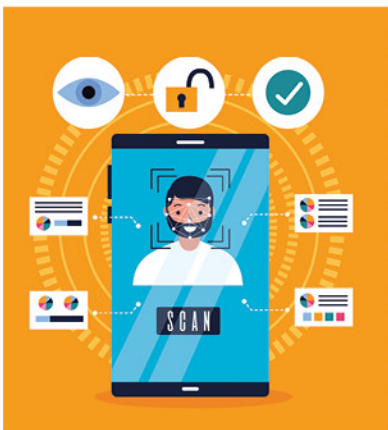
ARE WE DESTINED FOR A DYSTOPIAN TECH-FUTURE?



By: Jailane Salem

Technological advances have had a tremendous impact on human development throughout the ages. As one invention led to another, we have found numerous ways to improve our lives and make tasks easier to accomplish. As we moved into the realm of digital technology, the pace of change has picked up tremendously, and with it, the ways by which our societies function have also changed. Unless you live in an isolated corner of the globe that is off the grid, you cannot escape the impact of digital technology.

While technological advances have had a positive effect on our lives, they have not always been devoid of negative effects. The use of technology to destroy human lives and environments can be seen in several places around the world and throughout history. Technology in and of itself is neutral; however, depending on how it is used, it can have positive or negative effects. As the American historian Lynn Townsend White Jr. said, "Technology opens doors; it does not compel Man to enter."



Some people are quite pessimistic about the future of technological advancement and what it will mean for human development. This can be seen in the rise in popularity of dystopian fiction films and TV shows, which are not new; they were preceded by literary works such as *A Brave New World* and *Nineteen Eighty-Four*. Even those works were not the first to have a pessimistic outlook of what technological advances would mean for society.

With people developing addictions to games and screen time, there has been a noticeable shift in people's psychological wellbeing. Moreover, new digital technologies are often used to surveil people unbeknownst to them. These problematic trends have had many sounding the alarms, but is there merit to their alarmist attitude? In order to explore that point of view, it would be beneficial to have a look at the emerging technologies of today that may be the reason why some have a bleak outlook on the future.

Facial recognition systems are a burgeoning technology; you might have already come across it if you have a phone

that uses face ID to unlock. This facial recognition feature has been introduced to the iPhone in 2017; it works by first setting up a detailed 3D map of your face, which is stored on your device. Every time you look at your phone, your face will be detected; an infrared camera will take an image and, if it matches with the stored image, your phone will unlock. This technology makes accessing your phone very quick and easy.

While the use of facial recognition in this capacity is harmless, there are other uses that have been implemented that are receiving quite a bit of pushback. Another method of facial recognition is to compare one person's facial features against an existing database of facial images; it is the marriage between biometrics and artificial intelligence that is giving rise to this technology. Security forces are very much interested in this new technology because it will allow them to identify dangerous suspects in the midst of a crowd.

However, the algorithms of these technologies have shown that they are biased. In the USA, for example, faces of white individuals are easier to identify than minorities and this racial bias has caused problems already. In 2019, researchers for the National Institute of Standards and Technology found that facial recognition algorithms failed to correctly identify the faces of Asians and African Americans 10–100 times more often than white faces. This can lead to and has led to cases of mistaken identity, wrongful arrests and jailing of individuals, all due to the lack of accuracy when it comes to those algorithms.

There has been calls to put a halt to the use of facial recognition technology because, in its current state, it produces results that are not accurate and leads to adverse effects on vulnerable individuals. If you are wrongly arrested or jailed and that goes on your record, you may face future difficulties when it comes to looking for jobs, housing, and even banking services. Until more sophisticated systems are built, many giant tech companies and associations are calling for the suspension of the use of facial recognition technology.

Different Artificial Intelligence (AI) companies develop facial recognition technology; some have focused on "minority identification", or include that option in their algorithms. A process called machine learning is used to train artificial intelligence systems to recognize certain features and traits by feeding data into the system.

Ethnic digital profiling is not the only thing facial recognition software and surveillance cameras are used for. If you use one of those smartphone applications of transportation companies, you know that drivers, as well as customers, accumulate scores on the app, which can impact their experience. Your behavior determines your score, which determines whether you can keep using the service and whether you get to enjoy certain perks or not.

China is angling on creating such a system, but on a national scale; the State put forward the idea in 2014 and different provinces have piloted their own programs. They are still in the experimentation stage; however, it is all leading to one day having a centralized system. The social credit system is presented as being a solution to an ongoing problem in the Chinese society, that of a perceived trust deficit. Cases of economic and social fraud regularly go viral on social media, creating the sense that people are not to be trusted. The government wants to create a completely transparent society in order to curb corruption and fraud, and to reward good citizens and companies and foster trustworthiness.

It has already been shown that technology can replicate the biases we have as humans and affect people negatively. Whether these issues will be resolved in the future remains to be seen, but many are wary of what is yet to come.

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THE AGE OF CYBORGS

Cyborgs have been the ultimate human dream since humans started envisioning Artificial Intelligence (AI). The idea of humans transforming into cyborgs might come in handy as a way of survival; however, AI can be a double edged weapon that can both make life easier and at the same time lead to the destruction of life as we know it. What is it like to be a cyborg? How will that affect our lives both positively and negatively?

Cyborgs are humans with both biological and artificial parts, by which they can manage to be better versions of the pure human. The idea might seem fantastical, but by looking around us we see it is gradually happening. For instance, there are many humans with artificial body parts, mainly limbs, but some actually have artificial hearts. As such, we have a glimpse of what it is to be somewhat a cyborg; however, being a full cyborg—which means to have more than half of your body machinated—is still a concern for scientists who strive to make lives better. Tesla's CEO, Elon Musk, said in a conference that humans must become cyborgs in order to cope with the futuristic lifestyle ahead to avoid mass unemployment.

Scientists now are more concerned with whether these huge changes would affect the safety of our planet, as it did in the fictional works. AI might be a huge threat to humanity because the machines we manufacture will be aware



By: Mustafa Abo-Elmakarem

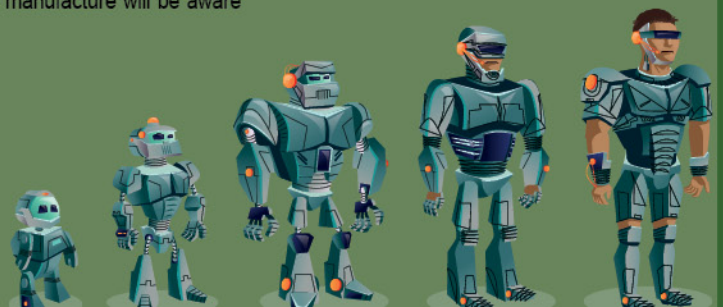
of themselves and their surroundings, which will allow them to take actions on their own; just like what happened to Will Smith's character in *I, Robot* movie. What if our replaced parts became self-aware and managed to make their own decisions? Will we face an internal war within our own bodies?

These fears are mostly because we all know that we are indeed imperfect, so we might say that we are afraid of ourselves in the first place. Therefore, before making any technological progress, we should first have it well studied as nothing will ever destroy humans but themselves.

To sum up, we do not know if we will have difficulties living with robots or becoming cyborgs; we have nothing but hope that every progress we make will not turn against us.

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By: Inas Essa

While we grow up believing in certain ideas and concepts about people, society, and relationships, psychological experiments may change our points of view with shocking results.

Good people deal with others kindly, while bad people behave badly; that is how we may think. Yet, in some cases, the line between good and bad is not evident. This is particularly true when it is related to the inner self that does not manifest itself in public, but requires triggers to show up. Here, an intriguing question emerges: Can good people turn into bad ones when exposed to certain situations?

The answer to this question was the scope of two of the most famous experiments in the field of social psychology. The first is the *Milgram Shock Experiment* (1961) by Stanley Milgram, who focused on the conflict between obedience to authority and personal conscience, and how people can harm others in response to orders they are given.

The second is the *Stanford Prison Experiment* (1971) by Philip Zimbardo,

Good & Evil In Light of AUTHORITY & OBEDIENCE

which was conducted to find answers for questions such as: What makes some of us lead moral lives, while others seem to slip easily into immorality? How do good people do bad and even devilish things?

Can obeying orders silence the conscience?



What roused Milgram's interest to conduct his study was the defense statement given by Adolf Eichmann, one of the major organizers of the Holocaust, who justified his acts by stating that he was following orders.

Participants of the experiment drew lots to divide them into "learners" and "teachers". Participants get separated into two rooms; in the learners' room, electrodes are attached to their arms, while the teachers and researchers have an electric shock generator with switches marked from slight to severe shock.

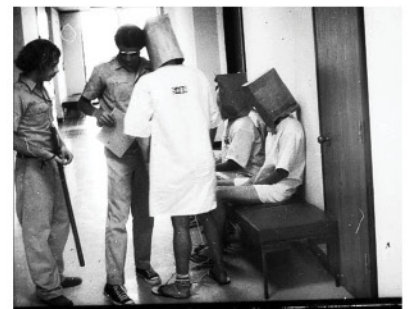
When the test begins, each time the learners make a mistake, they receive a shock that increases each time. On purpose, the learners give wrong answers, and the teacher gives them an electric shock. As the shock severity increases, the learners plead to be relieved under

any pretext. When the teachers refuse to administer a shock in response to the pleading, the experimenter orders them to go on with one of four prods:

1. Please continue.
2. The experiment requires you to continue.
3. It is absolutely essential that you continue.
4. You have no other choice but to continue.

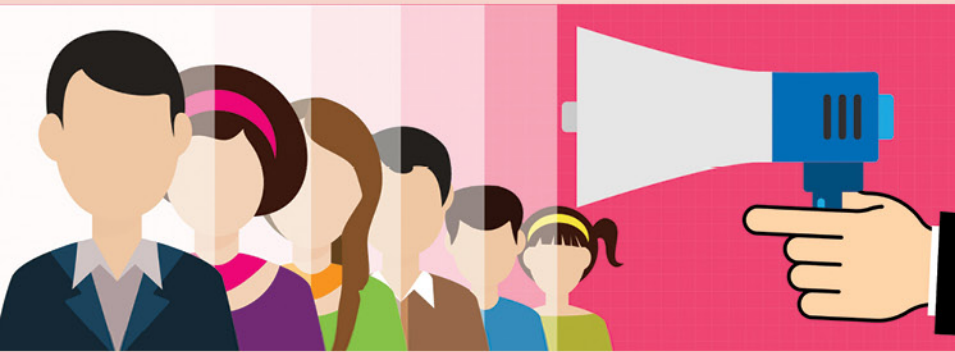
Although other researchers expected that only few teachers will go on to severe shock, results were shocking; 65% of them continued to severe shocks of 450 volts and all participants continued to 300 volts.

Can angels turn into devils?



The *Stanford Prison Experiment* was conducted to study the transformation of human character, and how confident we can be in predicting what we would or would not do in situations we have never encountered before.

It was conducted in a mock prison in the basement of Stanford University, which was set out to have barred doors and windows, bare walls, and small cells, with 21 applicants who did not know each other before the experiment. There were interviews to eliminate candidates



with psychological problems, medical disabilities, or a history of crime or drug abuse.

Afterward, they were randomly assigned to either the role of prisoner or guard. Prisoners were treated like real criminals and they were referred to by their number to make them feel anonymous. Guards, on the other hand, were dressed in uniforms, carried a whistle around their neck and a baton in their hands, and wore sunglasses to prevent eye contact with prisoners.

In the beginning, both guards and prisoners adopted their roles easily. Shortly afterward, some guards started to exercise control over the prisoners and began to harass them, while the prisoners soon adopted prisoner-like behavior and ratted on each other to show loyalty to the guards. After that, as prisoners became more submissive, guards became more aggressive. The experiment was terminated prematurely due to the emotional breakdowns of prisoners and excessive aggression of the guards.

Zimbardo suggests that guards behaved that way because they were placed in a position of authority, and they began to act in ways they would not usually behave in their normal lives. According to him, the experiment showed how the "prison" environment was an important

factor in creating the guards' brutal behavior even though none of them showed sadistic tendencies before the study. Prisoners, on the other hand, expressed developed helplessness, which explains their submission to the guards. They learned that whatever they did had little effect on what happened to them.

"The mind is its own place, and in itself can make a heaven of hell, a hell of heaven."

John Milton, *Paradise Lost*

In his 1974 article "The Perils of Obedience", Milgram summed up his theory that ordinary people are likely to follow orders given by an authority figure, even to the extent of killing an innocent human being. He added that this response to legitimate authority is learned in a variety of situations; in the family, school, and workplace.

So, if obedience to authority is ingrained in all of us as Milgram suggested, and situations we encounter can bring in us what we have never expected before as Zimbardo says, would it be easy to differentiate between good and evil in such contexts?

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Continued from page 3

A life-changing error

The second turning point was an accident that made Nobel reconsider all what he had achieved during his life, with all his inventions and 355 different patents. In 1888, when his brother Ludvig passed away, a journalistic error impacted him deeply as he read his own obituary, which was widely printed instead of his brother's. He was scorned for being the man who made millions through the deaths of others; a French newspaper wrote "Le marchand de la mort est mort"—"the merchant of death is dead". The obituary described Nobel as a man "who became rich by finding ways to kill more people faster than ever before".

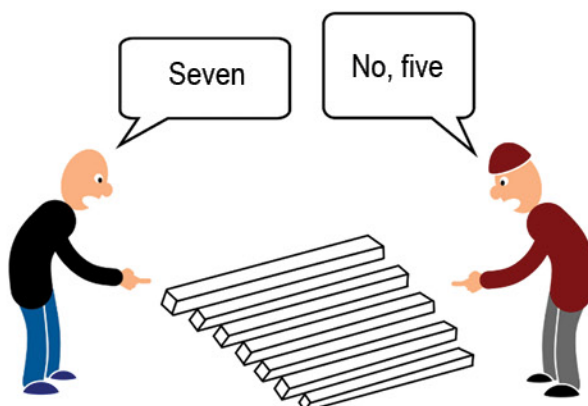
Nobel was reportedly stunned by what he read and with how he might be remembered; as a result, he was determined to improve his legacy. One year before he, Nobel signed his last Will, which set aside the majority of his vast estate to establish the five Nobel Prizes, including one awarded for the pursuit of peace.

This story does not only give us a hint about one of the most prestigious prizes in the world; it also sheds light on the possibility of extracting the good from evil, and getting the right thing back on track even after attempts of diverting its main path.

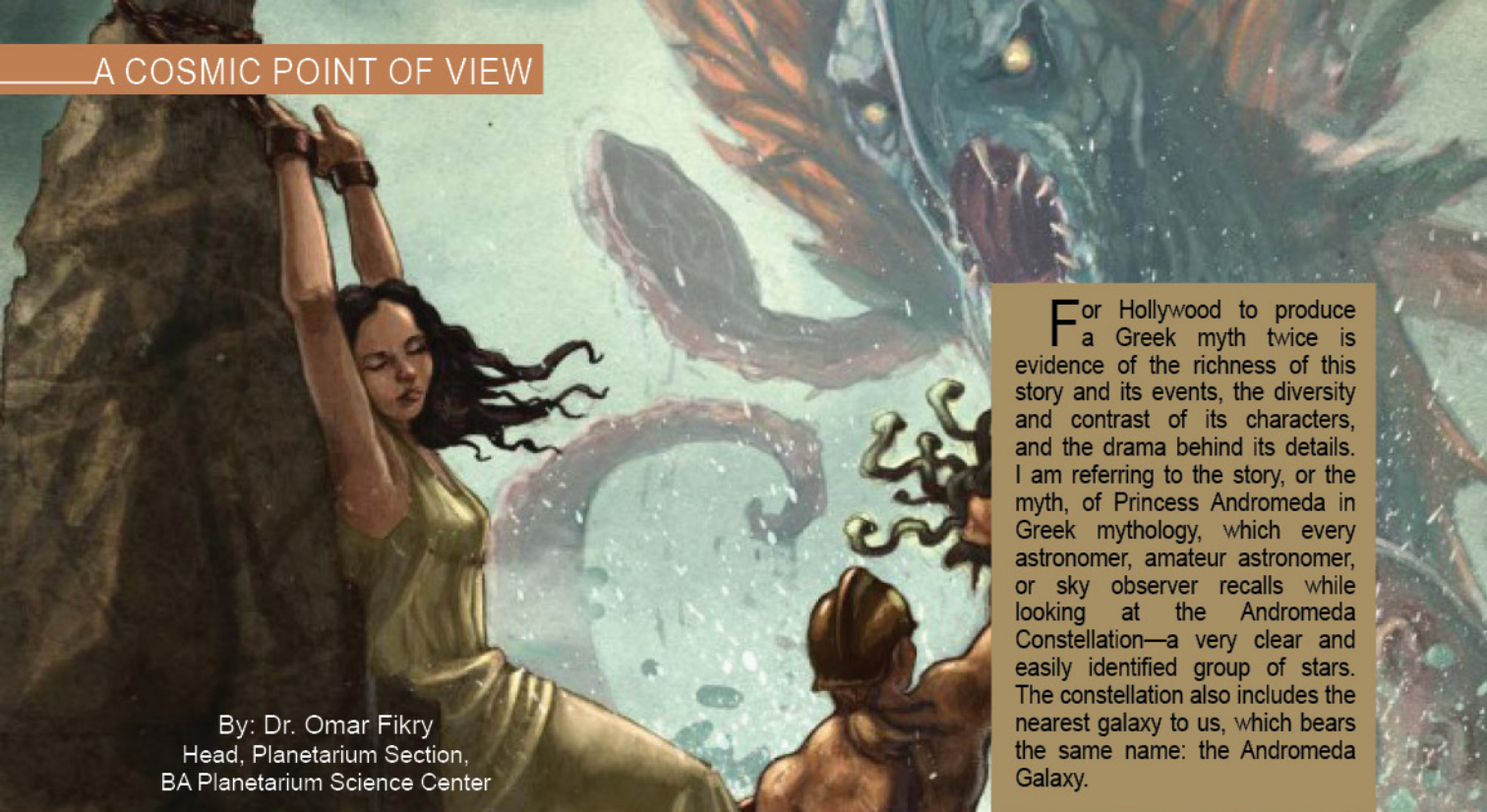
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How many sticks do you see?



Good and evil are a matter of perspective.



By: Dr. Omar Fikry
 Head, Planetarium Section,
 BA Planetarium Science Center

For Hollywood to produce a Greek myth twice is evidence of the richness of this story and its events, the diversity and contrast of its characters, and the drama behind its details. I am referring to the story, or the myth, of Princess Andromeda in Greek mythology, which every astronomer, amateur astronomer, or sky observer recalls while looking at the Andromeda Constellation—a very clear and easily identified group of stars. The constellation also includes the nearest galaxy to us, which bears the same name: the Andromeda Galaxy.

Princess Andromeda's Story: The Iconic Victory of Good over Evil

Pardon me dear reader! I got carried away to Andromeda Stars and the Andromeda Galaxy without first revealing the title of the two movies I am talking about or the features of the story at their center. The title of both movies is *Clash of the Titans*; it was produced twice: the first in 1981, where the beautiful actress Judi Bowker played the role of Andromeda; while the second was in 2010, where the great actress Alexa Davalos played the role of Andromeda. I invite you, dear reader, to watch both movies; you will enjoy watching them with your family.

The heroes and main characters of the movies and the myth are: Queen Cassiopeia, the daughter Princess Andromeda, and Prince Perseus, the son of Zeus, the King of gods, from a mortal lady called Danae. The story begins with a prophecy that Danae will give birth to a boy who will kill his mortal father, King Acrisius; as a result, the father confines his daughter in an isolated prison so that she neither sees nor is seen by anyone. Nevertheless, during her long imprisonment, Zeus was able to sneak into her prison in the form of a man and marries her, after which she gave birth to the child Perseus. A few months later, the king learnt that the prophecy was

fulfilled, and without any investigation into the marriage or the birth, decided to get rid of the child and his mother by putting them in a chest and throwing it into the open sea.

In the story, the waves carry the chest to a distant island ruled by a king named Polydectes, and the child grows up to be a skilled knight and warrior. On the other hand, on the same island, Queen Cassiopeia was conceited by the beauty of her gorgeous daughter Andromeda, boasting her beauty over all women on Earth and even mermaids. As a result, the

daughter of the sea god, Poseidon, sought revenge from the arrogant Cassiopeia by asking for the sea monster to pursue and destroy the queen, her kingdom, and her people.

The oracles advised Cassiopeia and her husband to sacrifice their daughter Andromeda to the sea monster to save the kingdom and its people. Consequently, the King and Queen unjustly accepted to sacrifice their innocent and beautiful daughter Andromeda; they tied her to a rock and left her to be devoured by the

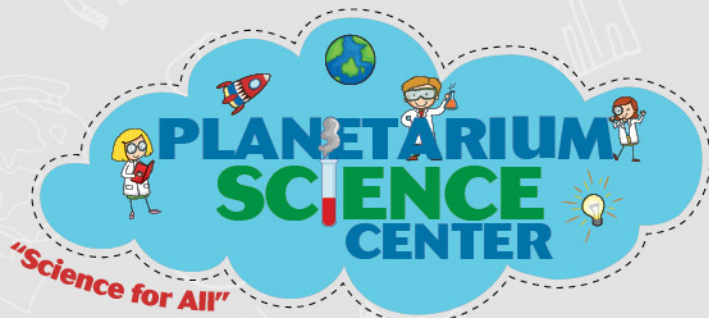


sea monster. Prince Perseus, who hoped to marry Andromeda, learnt of the calamity that befell her; he was promised to marry her if he succeeded in saving her from this tragic fate. The events of the movie follow the hero who learnt that the only way to save Andromeda from the sea monster was to behead the Medusa, who is the only one capable of killing the sea monster.

The Medusa was a charming woman who incurred the wrath of the gods, who in order to prevent her from getting married, turned her into a monster with poisonous snakes growing from her head in place of hair; she would also petrify anyone who looked into her eyes. What punishment, Medusa! After some exciting details, Perseus arrives where Medusa was, and with the help of the gods, his resourcefulness and intelligence, in an exciting scene embodied on the cinema screen, he was able to behead the Medusa without having eye contact with her. In a breathtaking scene, the hero confronts the sea monster and shows him the head of the Medusa; the monster is immediately turned into a stone statue that collapses before killing our innocent heroine Andromeda who would have been killed because of her mother's arrogance and selfishness.

Even though the story is simple and adventurous, you never get bored while watching it and you enjoy its details. At the end, you rejoice for the survival of Andromeda and wish you were part of Perseus's journey to obtain the head of Medusa and save his innocent beloved from injustice. You finish the story feeling happy and smiling because love and good have won over evil at the end. The Greek gods glorified the heroes of the story in the form of constellations to the North; you will find the Cassiopeia and the Perseus star groups in the North among the star groups that we, the astronomers, call "Circumpolar Stars". These stars always revolve around the polar star; we see them throughout the year as a sign of the continuous struggle between the meanings of good and evil.

One last astronomical information about these constellations: you will see the images of these stars more expressive than what was mentioned in the legend. You will find Cassiopeia in the form of a Queen on her throne; Andromeda is seen as a woman bound in chains around her hands and feet; while Perseus is holding a sword in one hand and the head of Medusa in the other.



Amidst the coronavirus pandemic, and in accordance with the directives of the Egyptian State and its efforts to mitigate the spread of the virus, the Bibliotheca Alexandrina (BA) has been closed to the public as of Friday, 20 March 2020, until further notice. Any updates regarding the re-opening will be posted on the Library's official website: www.bibalex.org.

As part of the BA's role as a center of excellence in the dissemination of science and scientific culture to the public, the Planetarium Science Center (PSC) has prepared a monthly program tailored to suit all ages, and anyone can follow it from home. Through the Center's official Facebook page, the PSC presents some interesting scientific experiments, interactive activities, Planetarium shows, fun science competitions, in addition to a number of Astronomy Nights and live astronomical observations. Follow us and enjoy our latest programs, so stay tuned!

The Bibliotheca Alexandrina Planetarium Science Center (PSC) invites its visitors to spend a day of fun learning, where they can enjoy amazing scientific shows that cover a diverse variety of scientific fields and are suitable for a wide range of groups at the [Planetarium Theater](#).

Visitors can also enjoy tours of the [History of Science Museum](#), which highlights scientific discoveries throughout three eras: Pharaonic Egypt, Hellenistic Alexandria, and the Golden Age of Islam.

Moreover, visitors can enjoy a collection of interactive exhibits that targets children and adults, workshops, DVD and 3D shows at the [ALEXploratorium](#) as well as shows at the [12D Theater](#).



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TWO IN ONE ?!

How is this possible?
You are OK. No, you are
not! Your lab test results
are mind blowing! This
case is strange, I do not
get it.

