"Somewhere, something incredible is waiting to be known." -Carl Sagan

Science, I believe, is the most humane thing there is. It evolves like we do, it makes mistakes (and corrects them) like we do, it *grows* like we do - always expanding and culminating more and more mass into an ever-present ocean of knowledge. As we fall back into the comforting lull of normal school life (*finally)*, science has remained what it used to be - a constant.

This issue aims to venture deep into the ridges and grooves of our mind, with articles ranging from exploring different mental illnesses to those bringing attention to incorrect media representation of the same. It questions the very nature of human psyche - what is mob mentality, or the Dunning Kruger effect? Why are they so common? What is it about human memory that makes it so unique? Why do some of our senses seem more connected to the brain? We have also advanced into the strange world of Noetic Science and freaky, mind-eating parasites. Moreover, this issue dares to question even the existence of human consciousness - are the mind and the brain the same?

As this editorial comes to a close, one thought persists in my head - do our "intelligent" brains truly make us smarter than all other species, as we like to believe? Is it not our mind that has constructed for us this reality - that requires of us a job, a reputation, a social presence - in bizarre contrast to other mammals that simply eat, breathe, and sleep? Have we not brought upon ourselves gratuitous prejudice in the form of sexism, homophobia, politics?

Or rather - is mankind actually as evolved as we think it is?

Ananya Makker
Editor-in-Chief

MENTAL DISORDER OR VILLAINY?

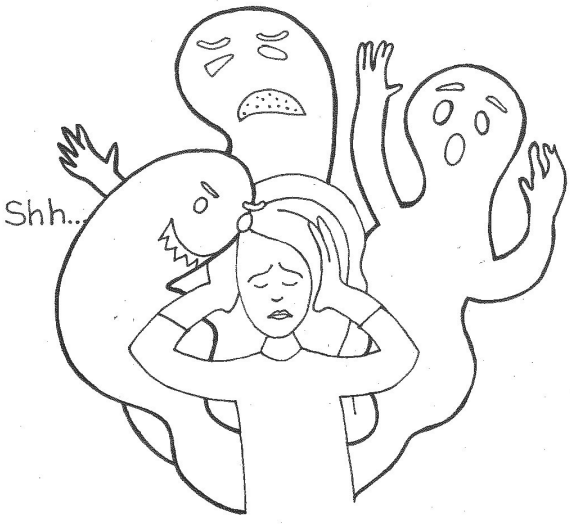
Have you ever experienced the inexplicable inability to recall key personal information about yourself? Or a strange form of depersonalization from yourself and your actions? All these are symptoms of dissociative identity disorder, a mental disorder characterized by the Diagnostic and Statistical Manual of Mental Disorders (DSM-5-TR) as the maintenance of at least two distinct, independently functioning, and relatively enduring personality states (alters and host – each having a specific pattern of perceiving, relating to, and thinking about the environment and self) of which only one is manifested at a time. .

The neuroscience behind people suffering from D.I.D. makes for a very fascinating study. Neuroimaging confirms structural differences in the brains of people having 'alters.' Studies show that their amygdala, a part of grey matter in the brain involved with experiencing emotions, is smaller compared to healthy subjects. And the volume of the hippocampal, another major component of the brain concerned with the consolidation of information, memory, and navigation, is also smaller.

In the movie Fight Club (1999), the unnamed narrator dissociates into Tyler, a man that is completely opposite to what the narrator is really like. By the end of the film, the narrator is "captured" by Tyler, and must force himself to "kill" Tyler to free himself from his alternate identity. This propagates the idea that alters can be terminated which is **scientifically not possible**. This also implies that the alters are aware of each other's existence, which is often not the case for someone who lives with D.I.D. because they create an amnesic barrier.

Secondly, in the movie Split (2017), James McAvoy stars as the main character who has twenty-three alters along with a bestial twenty-fourth emerging, which is referred to as the "Beast." His host personality, or original personality, has a therapist who talks about the disorder as a new form of evolution, **instead of as a mental disease.** McAvoy's character kidnaps three teenagers, and as his latest personality forms, he has a craving for human flesh and devours two of the three girls. This film shows alternate personalities to be not only violent and destructive but cannibalistic as well — which is **wildly inaccurate.**

Most movies continue to show the unrealistic myth of dissociative personalities to be brutal and savage and cast them as villains. They need to understand that the formation of multiple personalities is a way to cope with long-term physical, sexual or emotional abuse and trauma, and not as a weapon to harm others.



If any person suffering from mental disorders requires help, they can contact the Helpline number in India – 1800-599-0019. Anyone who wants to learn more about DID can refer to @dissociadid, @encinasevera (Instagram)

- Anushka Agarwal and Chitrangada Tiwari, Class 11

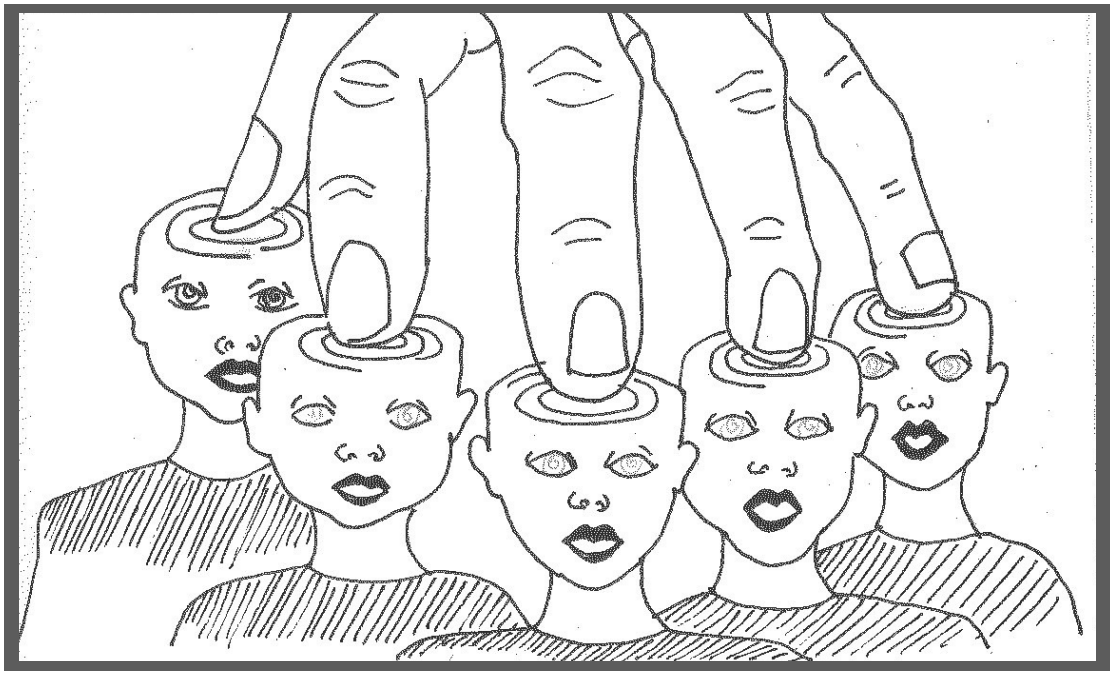
MOB MENTALITY

Have you ever changed your McDonald's order because your friends wanted something different or stopped liking a particular person because they were unpopular? If your answer is yes, you had fallen prey to a common behavioral tendency called mob or herd mentality. Mob mentality refers to when an individual is affected by the opinion of a large group of people and changes their own decision to fit into the given social norm.

Modern psychologist A. N. Klucharev recently proposed a hypothesis which had a central idea that people have a built-in sense of being like others. The hypothesis claimed that when we differ from the crowd our brain triggers a signal saying, 'You are wrong; change your mind immediately!' In our day-to-day life, most of us continuously change our decisions because they don't fit the social norm or aren't accepted by other people around us.

There are also many ways for people to restrain themselves from following a group of people or social norms. This can be enforced by perceiving and introspecting one's own thoughts before listening to others' opinions. It can happen by analyzing the prejudice and the bias one may have and judging one's own opinion before anyone else's. This, unfortunately, is easier said than done - we tend to wind up in these situations all the time.

However, mob mentality is not all bad, it can also have a positive effect as it may help an individual to learn and perceive information in a different way. For example, many protests happen because of mob mentality, and many have a very positive influence and impact on society - leading to revolutions.



- Saamya Malhotra, Class 12

The Dunning-Kruger Effect

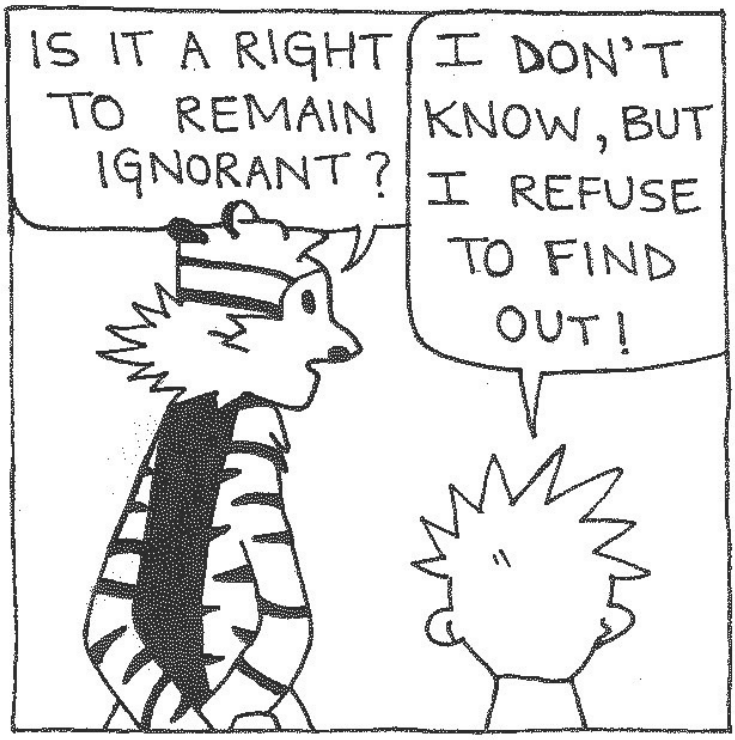
"All I know is that I know nothing"
~Socrates

Meet Kelly - they have been studying psychology for about three years now and they believe that they are the best in their class. When the teacher shows them their annual report their face falls because they have scored the lowest in their class. Kelly fights with their teacher and repeatedly states that it is impossible for them to have scored such low marks. Kelly here, illustrates a psychological phenomenon called the Dunning-Kruger effect.

Dunning-Kruger effect is a cognitive bias in which people overestimate their knowledge and ability in specific areas. They tend to assume that they are more capable and smarter than their colleagues. People experiencing this effect possess low self-awareness and poor cognitive abilities. It is generally a metacognitive phenomenon where people who perform poorly in a task believe that they have performed better than the rest.

People who are suffering from this are incompetent and ignorant of their surroundings. In the case of Kelly, there is a clear overestimation of their capabilities. In lieu of their over-confidence, they may have not reviewed their answers, (as people affected by the Dunning-Kruger effect fail to recognize their lack of skill) subsequently failing to acknowledge their mistakes. There also exists a possibility that Kelly was not actually incompetent, but simply had blind-spots that prevented them from using said competency. Affected individuals commonly mistake their miniscule knowledge of a new topic as expertise in that area. Heuristics, which are mental shortcuts which help people to make inferences more efficiently, also contribute to this effect.

To overcome this effect, we should try to gain more knowledge about the topic at hand. This will make us identify our own mistakes and will actually make us an "expert". Moreover, a well-rounded education system should be encouraged as it would help us to logically and critically evaluate situations. It would help us in knowing more than what is prescribed in the syllabus. The government should also put emphasis on proper education. Constructive criticism should be accurately provided and people should try to understand it and work on their weak points.



- Ishita Jain and Sanviti Dwivedi, Class 12

WHAT THE INTERNET IS DOING TO OUR BRAINS

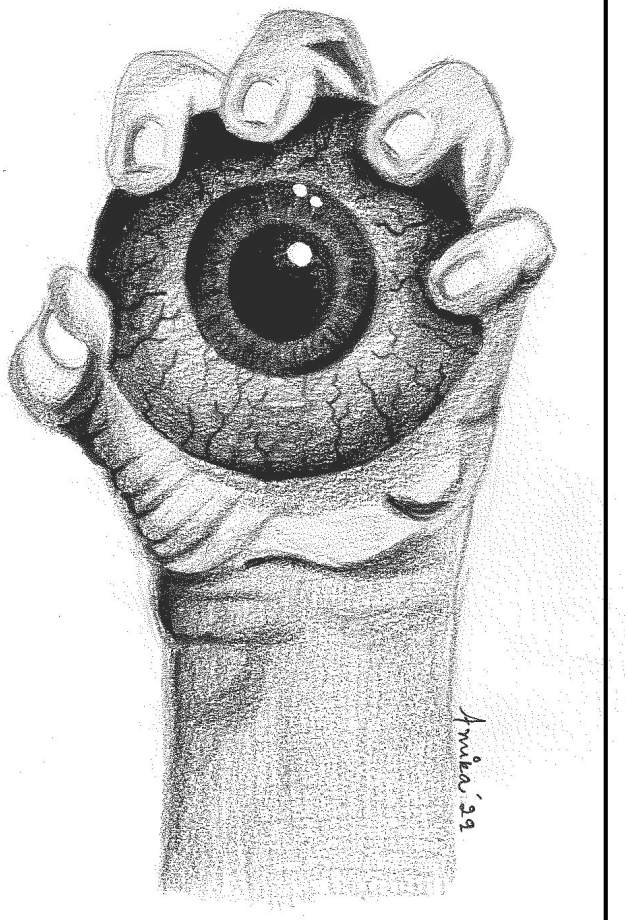
With the increasing use of the internet and technological devices in daily life, it becomes imperative to understand how (if at all) the internet – which is essentially a product of the human brain – is influencing that which created it.

One often hears that due to the increased availability of Google and similar search engines, children do not care to memorize facts that generations before them knew on their fingertips. This trope has led people to believe that the internet is making students stupid. Whether there is any truth in this chain of thought remains to be discussed.

Several research projects have been designed to explore the interdependence between the human brain and the internet. A professor at Harvard University stated that the internet is not decreasing our memorizing power – rather, it is shifting our brain's focus. Instead of remembering what the capital of Kazakhstan is, we remember how to switch on our computers, open google, and type something that would yield us the required result. Despite the procedure being fundamentally different, one arrives at the same answer: Astana.

Psychiatrists at University of California, Los Angeles conducted neural scans on two sets of people: those who use the web frequently and those who are quite new to it. The scans revealed that in web-users there was a lot of activity in their dorsolateral prefrontal cortex (associated with short-term memory and decision-making) when they were using Google, in contrast the web-non-users showed no activity in that region. The non-web-users were instructed to use the internet for an hour each day for five days. Post this, their brains were scanned again. In the words of Dr Gary Small, the lead researcher in this study, "After just five days of practice, the exact same neural circuitry in the front part of the brain became active in the internet-naïve subjects. Five hours on the internet, and the naïve subjects had already rewired their brains." This goes on to show how much the internet can affect our brain and in how little time.

Further research through case studies revealed that after just ten days of playing video games on the internet, children showed better reflex response, had considerably improved hand-eye coordination, and could process visual cues easily. Another study suggested that people who browsed the web frequently could solve problems faster and could better assess the trustworthiness of sites. However, developmental psychologist Patricia Greenfield says, "every medium develops some cognitive skills at the expense of others." The internet may have improved our visual-spatial skills, but its excessive use reduces our ability to consume knowledge mindfully and think critically.

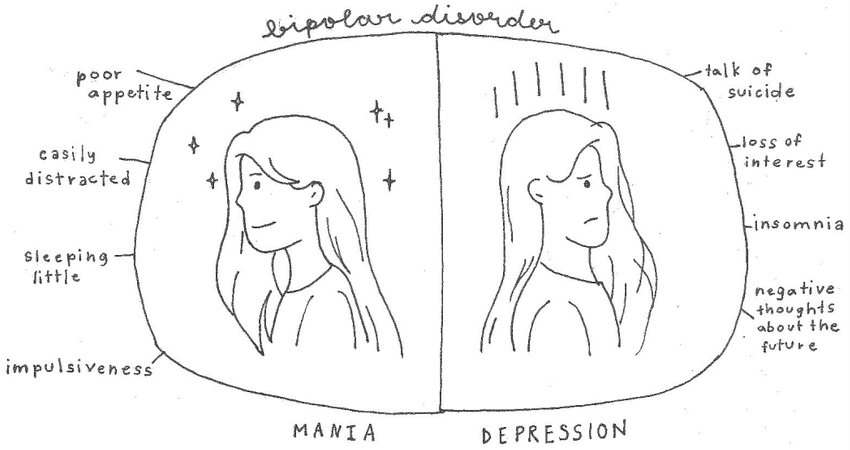


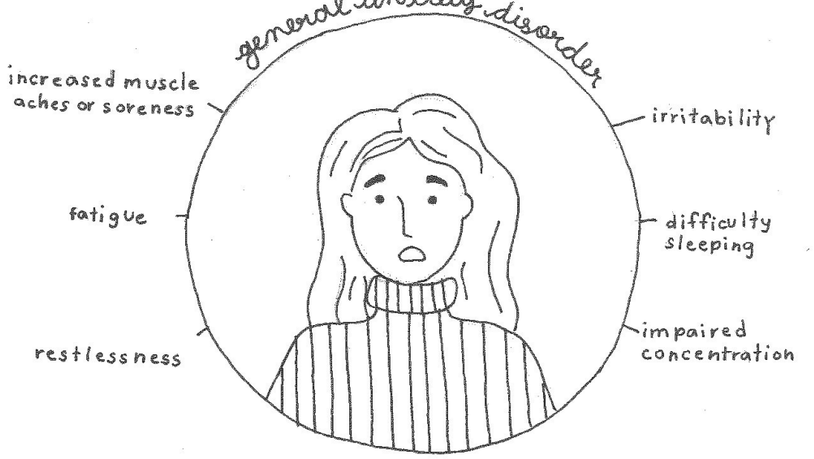
It is vital to note that while the above discussed impacts make it seem like the internet rewires our brain completely, neural plasticity (the extent to which external factors can alter the brain's working) is quite a disputed concept. Cognitive neuroscientists believe that the effects the internet has on one's brain have been exaggerated beyond reason.

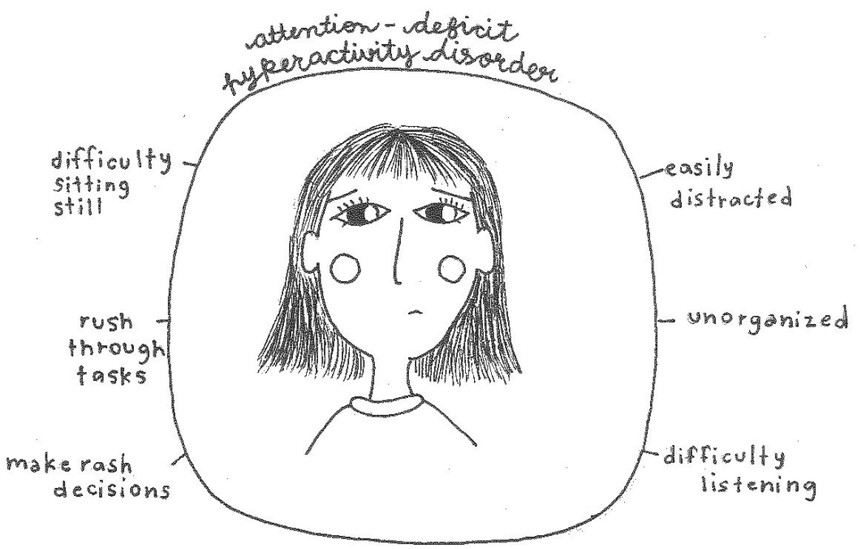
While it may be useful to know what research suggests the internet does to our minds, its exact influence is yet to be agreed upon by the scientific community. The trick for our harmonious co-existence with technology is to strike a balance between digital detoxes and its rampant and continuous usage.

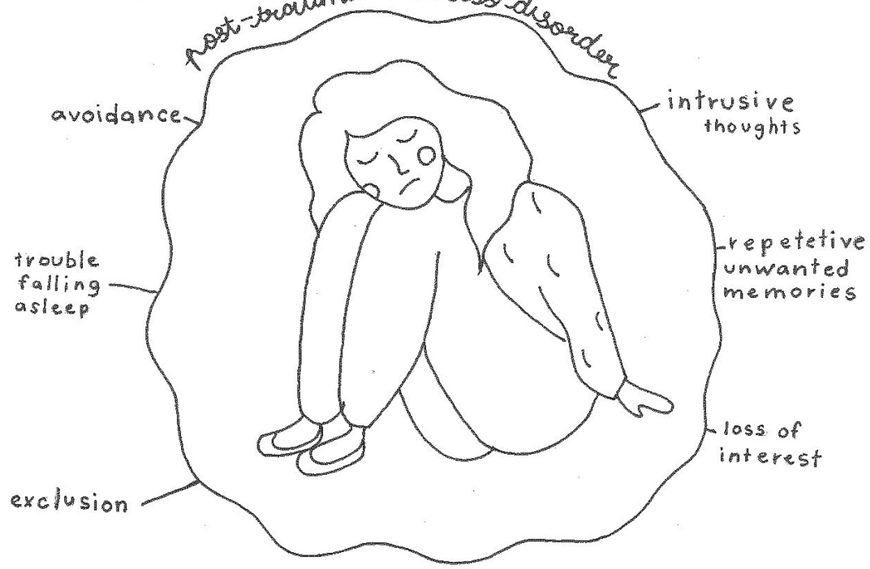
- Himanshi Gupta, Class 12

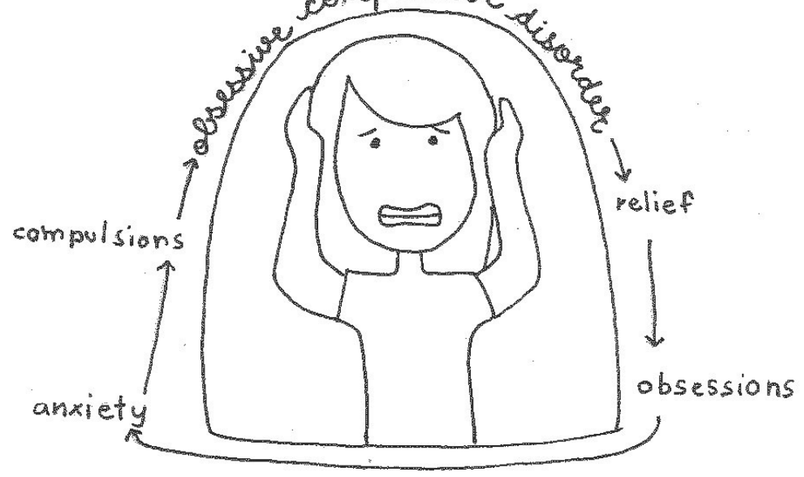
symptoms of some common mental disorders

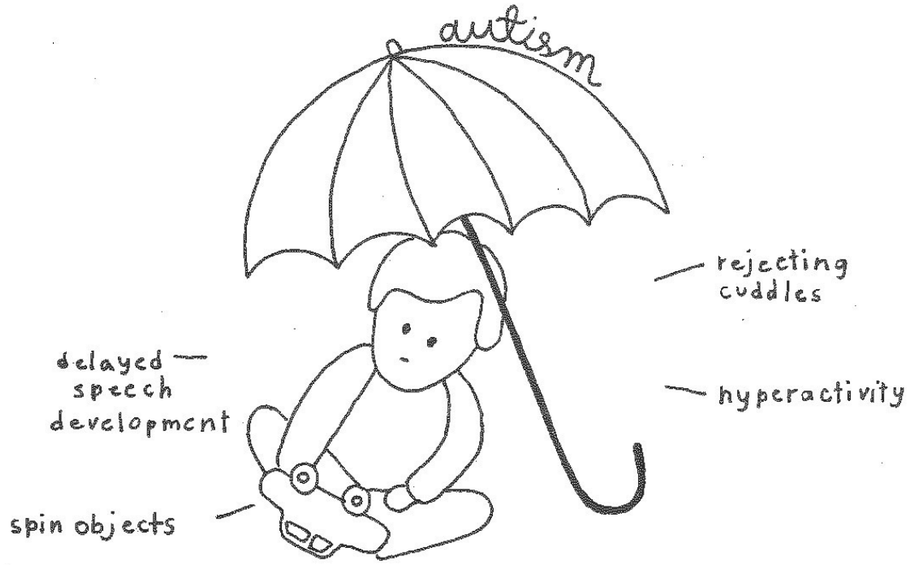










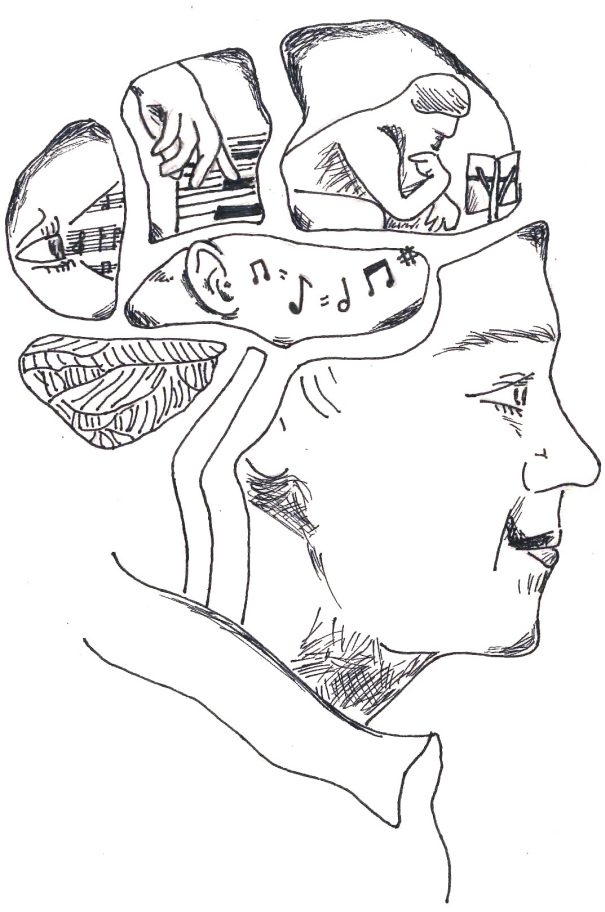


The Sound of Music

Dopamine is a chemical released in our brain while we listen to music or engage in a multitude of other enjoyable activities. It's what gives us the chills – the same chemical that is released when we fall in love. Music also distracts the brain from registering fatigue – giving music both a psychological and physiological advantage. Extensive research has proved that playing a musical instrument can enhance your memory power as well. Nowadays we hear music all around us - from soft tunes waking us up in the morning and intense hip-hop motivating our workouts to indie music that keeps us company on our commute and pink noise that helps us fall asleep at night. It doesn't matter what kind of music it is, music itself can affect our moods and our bodies in all sorts of ways. We bob our heads, we dance, we sway; music helps us unwind - it even has the potential to make us cry. Music activates every area of the body we have so far mapped. No area in the brain is untouched by the sound of music.

When music enters the brain and then gets shuttled off to different parts of the brain, it starts a specialized process in the auditory cortex. Your visual cortex is activated when you read music and your motor cortex when you engage in physical activities like tapping your feet, snapping your fingers, or clapping your hands. The part of the brain called the cerebellum works in harmony with other parts of the brain to affect rhythmic movement in the body when moving in response to the music. The memory system in the hippocampus activates on hearing a familiar passage in your memory banks. There are all sorts of brain activity happening.

If you have been trained in music for over 5 years, it has probably had various benefits on your cognitive skills, decision-making, social behaviour as well as brain structure. Children who have studied music have a stronger connection between the left and right hemispheres of their brain which makes them creative problem solvers.



When you hear musical pieces it's easy to understand why emotions have such an important role in music. Some people get goosebumps, chills, and a weird tingly sensation. Others get sad, disgusted, or even annoyed.

Some people's brains may also have better communication in what they hear and how they feel. You realize very quickly that nothing is threatening in the music and then you start to experience the pleasure of hearing the song. Whether you find intense pleasure in a song or despise it, you experience miraculous results in your brain. It triggers the brain's internal Opioid system – this is just like the drug helps you feel good and relieves pain. Music is a feeder road that can help strengthen brain connections. It is about much more than just letting go and the notes we read. It can change the way we think, behave, and even emote.

- Tahira Kaur Dhillon and Myrah Sahni, Class 12

NOETIC SCIENCES

BRIDGING SCIENCE AND SPIRITUALITY

"The day science begins to study non-physical phenomena, it will make more progress in one decade than in all the previous centuries of its existence." -Nikola Tesla, Inventor and Futurist

The yellow-stained pages of Dan Brown's 'Lost Symbol' pushed an unorthodox branch of science into the limelight (not all for good reasons though!). Noetic Science has been juggling an identity between a hoax and a 'legitimate science' for decades now, sparking multi-faceted debates all around the globe.

The term 'Noetic' is derived from the Greek word noēsis/ noētikos, meaning inner wisdom, intuition or implicit understanding; while science refers to the system of using observation and experimentation to explain natural phenomena. Thus, Noetic Sciences aim to explain the unexplainable by bridging the gap between science and spirituality.

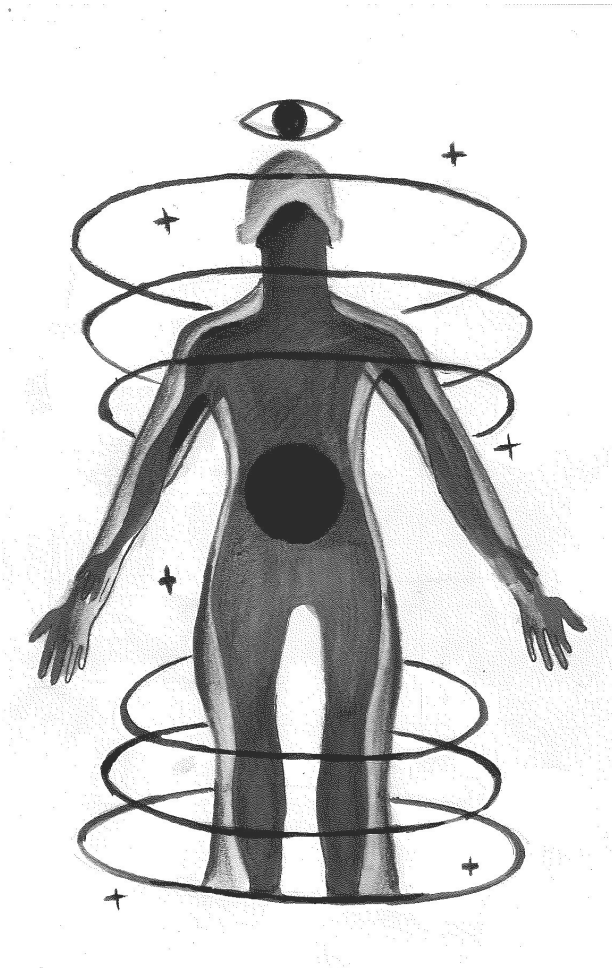
This discipline explores the interplay between scientific knowledge and inner knowledge. In 1973, Dr. Edgar Mitchell established this new branch of science during his Apollo-14 mission to the moon. He articulated the goal of Noetic Science as, "revealing the interconnected nature of reality through scientific exploration and personal discovery." The basis of this interdisciplinary was built on the anvils of Michell's own personal experience of being "enveloped by a profound sense of universal interconnectedness."

Institute of Noetic Sciences is the leading research facility delving into the sphere of intertwining science and spirituality. IONS is dedicated towards 'broadening our knowledge of the nature and potentials of mind and consciousness and applying that knowledge to enhancing human well-being and the quality of life on the planet.'

Noetic Sciences have encountered countless allegations of being 'fake' and 'unrealistic' for claiming that human thought can affect physical mass. The main criticism stems from the lack of developments in the field which can justify the claims of those who believe in this science.

While some scientists discredit Noetic Sciences entirely and attribute its success to 'poorly controlled environments during experiments', there are some who are willing to go hunt for answers as they recognize the potential it holds for human evolution.

Do you believe Noetic Sciences can finally bridge the age-old rift between science and spirituality?



-Nandika Poddar and Tanvi Agarwal, Class 12

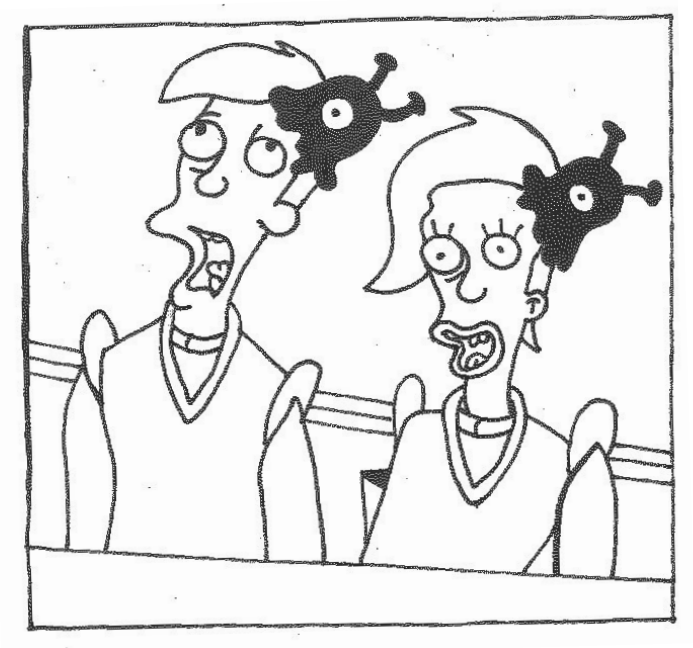
MIND-ALTERING PARASITES

Having over 6 million species on the planet, parasites are known for their rapid evolutionary characteristics that although result in short generation spans, enable them to have large population sizes. This is done by simply feeding off nutrients from their host, during which they can even surpass their growth rate!

The most common diseases known to affect human life such as Malaria are caused by the protozoan *P. falciparum*. African sleeping sickness is caused by protozoan *Trypanosoma*. Various intestinal functions are also caused by a plethora of roundworms. These are all evidences of the devastating consequences that parasites have on our everyday lives. To make matters worse – recently, scientists have adventured upon the even more fearsome 'mind-altering' behavior of these organisms. After years of co-evolution with their host, parasites have now been discovered to possess the capability of manipulating the host organism's cognitive behavior. This has, obviously, branched a new field of science known as **neuro-parasitology**.

The most prominent example amongst these is *Toxoplasma gondii* – a parasite that can affect all species of life but can peculiarly only lay its reproductive eggs in cat faeces. The parasite produces cysts that can travel up to the human brain (surprisingly, this is not out of a science fiction movie plot) and create disruptive changes in the levels of dopamine (the neurotransmitter that relays messages between nerves to arise feelings of happiness and satisfaction) which further leads to devastating chronic problems like suicidal behavior and schizophrenia. Hence, it is often advised to pregnant women, babies, and the elderly to not go near cat faeces as *T. gondii* can prove to be fatal to people with low immunities.

Spinochordodes tellinii is another parasitic hairworm that infects crickets with its larvae. On the completion of their growth, they release neurochemicals to stimulate the host to jump into water. When the cricket drowns, the parasite gets the opportunity to infect the aquatic environment and propagate more of its own.



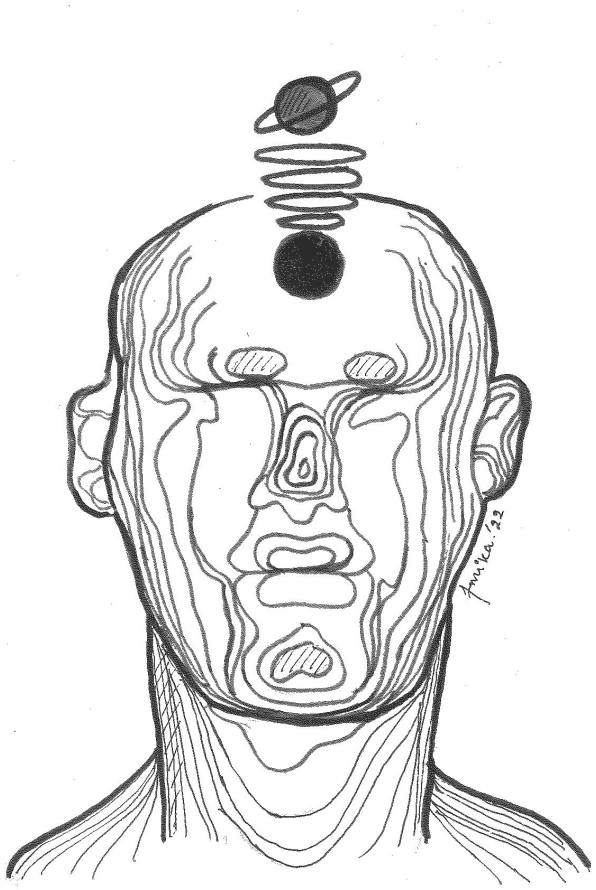
Scientists believe neuro-parasitology to be an emerging field of study as it allows us to understand the unique hidden powers of every biomolecule that constitutes an organism.

-Devika Aggarwal, Class 12

CONSCIOUSNESS

"We know nothing about the intrinsic quality of physical events except when these are mental events that we directly experience."
Bertrand Russell

Where is your mind located? Is it in your brain? Is it in your armpits? Or perhaps it lies in the wiggly space between your toes, or your heart, or even your intestines (**cue audible gasp**).



As stupid as the question sounds, it is actually a topic of great musing amongst several well reputed philosophers, biologists and physicists. The 'mind' here refers to the consciousness, (not our physical, 1.5 kg blob of jiggly neuron meat, which is the brain), although biologists theorise that the two are evidently intrinsically related. A study by Adrian Owen, a neuroscientist at the University of Cambridge, showed that, when given verbal commands in the non-responsive state, the parts of our brain that light up in an fMRI machine are similar to those that belong to a healthy one. This means that consciousness may arise simply due to a series of electrochemical reactions in certain areas of the brain.

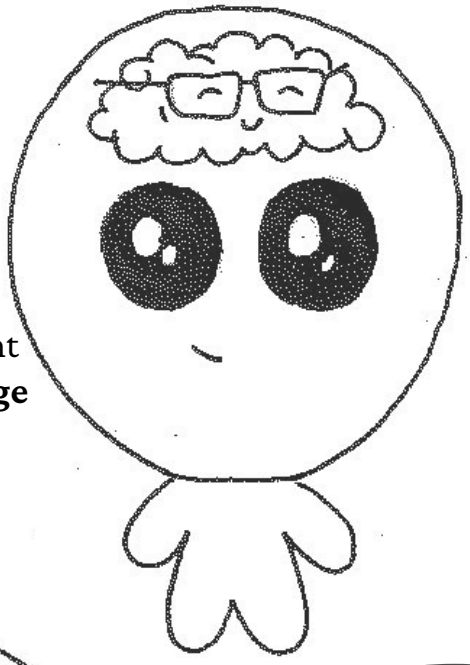
However, philosophy entails many theorised concepts regarding the nature of consciousness. There is dualism, which characterises humans as having both a physical 'brain' and an abstract 'mind' as two separate entities. They interact with each other through a two-way path to help us perceive reality as we do, that is, the brain influences the mind, and the mind influences the brain. On the other hand, some argue that the brain and the mind are ultimately the same thing, or at least invariably influence each other.

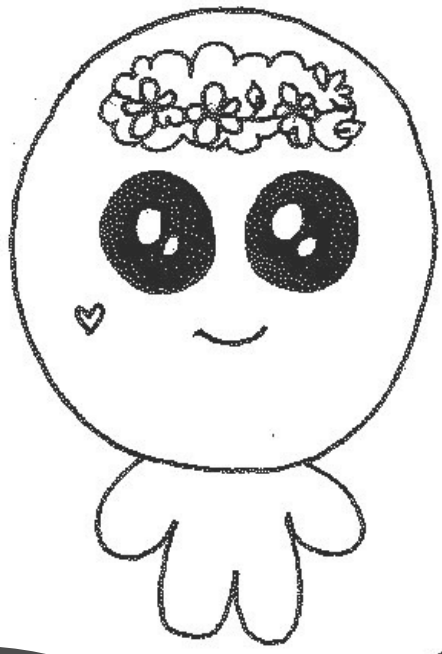
Science has established that we ultimately perceive only one reality, and hence, the brain and the mind must be the same thing, or at least invariably connected to each other. This gives rise to the theory of monism, which, actually, questions the very existence of mind in the first place in a sub-theory popularly referred to as materialism. According to this concept, mental processes are simply a consequence of the physical activity of our brain's neurons. This, in turn, also counters the question we posed right in the starting, for does the mind exist at all? In stark contrast, phenomenalists believe that it is only the mind that exists, and all physical phenomena we experience are only perceivable to us through consciousness.

Physicists have a whole other thing going on for them (they are physicists, after all, their job description necessitates questioning reality). The only two categories that exist for them are - physical and, well, nonphysical, - and consciousness (obviously) falls in the latter. That is, like the definition for any emotion (such as love, or anger, or jealousy), the mind is simply an abstract, immeasurable quantity.

Although the question remains unresolved still, we hope this insight helped your mind understand why its existence is, well, such a mind-boggling wonder.

-Ananya Makker and Shubhika Khanna, Class 12





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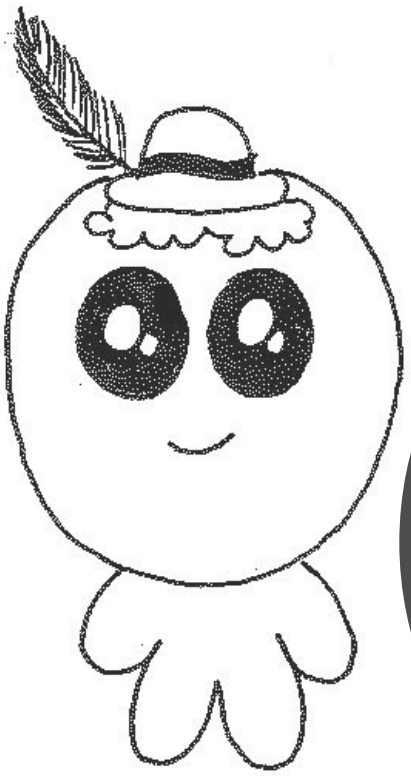

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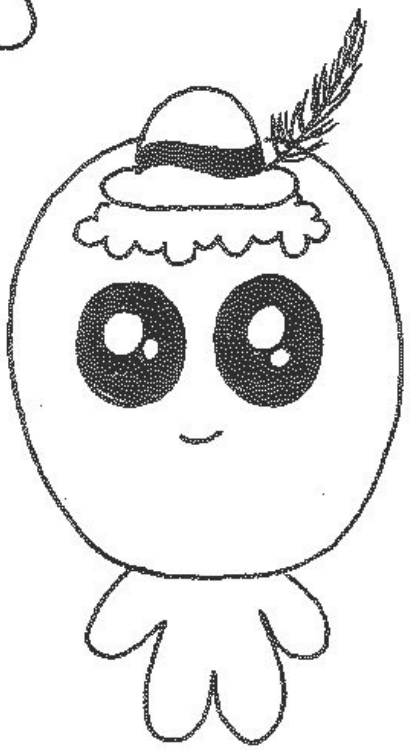

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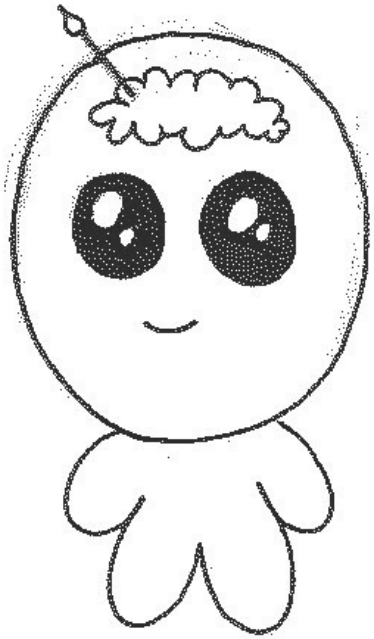

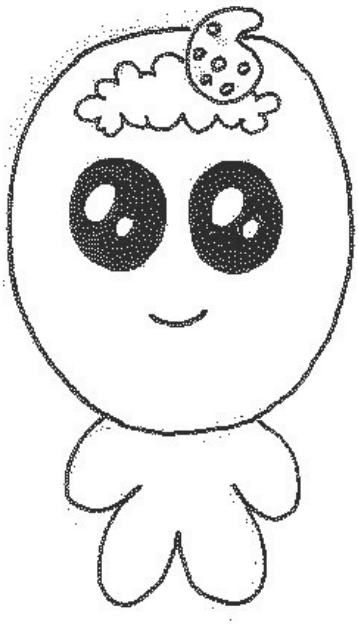

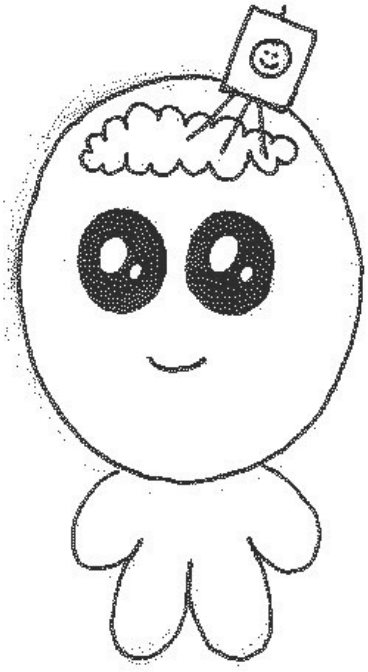

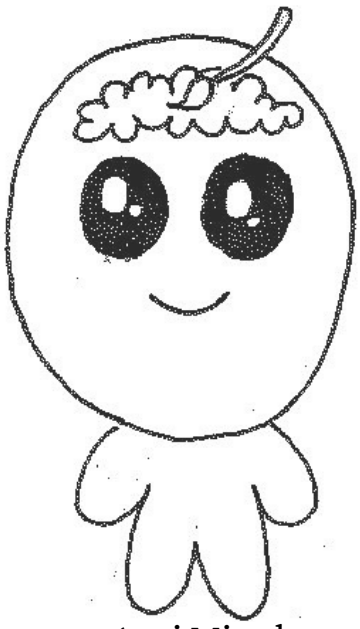

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