The Youth Science Journal Of Iraq

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YSJOI ISSUE #2

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A Short Editorial:

YSJOI - by the youth, for the youth of Iraq!

In the great land that was once Mesopotamia, and the home of the hanging gardens of Babylon, progress in science has slowed.

Why?

Because the youth of Iraq have no platform to build upon! Opportunities to learn about science, technology, engineering, and mathematics are rare, and students trying to learn about them are even actively discouraged – I speak from experience.

But instead of surrendering to that silence, I have chosen to rally the youth of Iraq. If we do not have a base to stand on, we will build one!

And the first step to that is this Youth Science Journal Of Iraq, YSJOI, where we aim to provide that very base – an opportunity to teach, learn and explore through different articles – be it inspiring them, writing them, or reading them!

Thank you for being part of this beginning.
Now, dive in – into the weird, the beautiful, and the wonderful.

–Satvik M. Bhure, Founder of YSJOI (*Inauguration speech, 2025*)

Question I: What would happen if the Earth stopped spinning?

– Ayaan Ahmed, 13

Imagine that one day, the green-and-blue glorious marble-like geoid that we call the Earth suddenly stopped spinning. Well, before anyone could react, anything not fixed firmly to the floor would immediately fly due east at about 1,670 km/h at the equator, and every ocean, human, bird, tree, car and animal would go flying at that speed. The oceans would slosh out of their basins and flood cities, creating enormous tsunamis, and raze entire cities as they worked in conjunction with the wind! The total momentum before any action is equal to the total momentum after that action, and so everything would have to move around to account for the lack of motion of the earth.

If, however, the earth slowed to a standstill instead of destroying everything instantly, then it would get tidally locked to the sun. One side of the earth would be scorched by the sun, turning into a scorched landscape with heat that would put the Sahara Desert to shame, while the other would freeze to turn into a cousin of Antarctica! The only place where life might survive would be a thin, narrow strip between those two zones, perpetually in twilight, where temperatures might remain temperate enough to enable agriculture and human life. Eventually, gravity would shift. As the spin of the earth causes it to bulge out at the equator, if the spin stopped, this bulge would shrink, and the oceans would drain from the equator to the poles. Places like Brazil and Indonesia would become kin to the deserts of the Middle East, and Canada, Russia and Scandinavia would drown under new oceans. Weather – any spiraling storms or winds – would decline, leaving just great convection currents carrying hot air upward from the sunlit side and dumping cold air down on the dark side. The magnetic field might weaken over time too, because Earth's core dynamo depends partly on rotation. Losing it would allow harmful cosmic rays to bombard the surface.

Basically, the earth ceasing its spin would be pure destruction, for our world is built on motion and the beauty of the world that comes with it.

The Earth must turn for life to go on.

Question II: How does the brain work?

– Parwar Phicri, 14

The brain! Our very own universe, one made for each of us as we grow in our mothers. One made entirely of haphazard electricty and questionable chemistry, to be exact – because those two are the exact ways in which our brains work. That is how you – and your brain – work, whether you are a storyteller, engineer, chemist or a soldier; your brain works though about 86 *billion* neurons, which are tiny cells that pass around messages via electrical impulses. Each one forms thousands of connections – and this is where the engineering of nature comes into play, because every though, action and emotion that ever occurs is a product of these neurons 'talking' to each other through these connections, called *synapses*. A neutron, on firing, sends an electric signal down the axon until it reaches the synapse – here comes the conjunction of physics, chemistry and biology that enables life. The electric signal is converted into a chemical signal, where little molecules called neurotransmitters leap across the microscopic gap to the next neuron. Every chemical handles something: dopamine gives us motivation and reward, serotonin gives us a better mood and improves well-being, glutamate helps us learn; so many of these chemicals help us on a daily basis.

The brain is always adjusting these chemicals, strengthening some connections while weakening others to adapt, improvise and overcome. This constant rewiring is called neuroplasticity, and it's why you can learn, grow, change habits, and recover from injuries. Different brain regions fulfill different duties - the cerebrum handles thinking, language, reason, imagination, and decision-making; the cerebellum fine-tunes movement and balance; the limbic system rules your emotions, instincts, and memories. And deep inside, the brain stem keeps your heart beating and lungs breathing without you ever having to think about it.

So simply, how does the brain work? It dances an infinite dance of electricity and chemistry, weaving your memories, thoughts, dreams, fears, and personality into the living story of you – because you think, therefore you are.

Question III: Can we edit genes to cure all our diseases?

– Ali Ahmed, 16; (answered in conjunction with Ahmed Muhammed, 15)

Gene editing is one of the most exciting parts of modern science — the idea that if a disease is caused by faulty DNA, we could simply fix the DNA and erase the disease forever. But can we cure *all* diseases this way?

We talked about gene editing in the last issue as well, where we explained *how* it happens - so naturally, application is the next step! Firstly - we already use gene editing to treat some of our diseases. In 2022, sickle-cell anemia was treated with CRISPR-Cas9. Some cancers can be treated by editing immune cells so they can hunt cancer more effectively. We're actually also working on cures for cystic fibrosis, muscular dystrophy, blindness, and even HIV! So yes, gene editing can definitely cure diseases ! But all diseases? That's where things get somewhat more complicated. Some diseases are caused by just one or two damaged genes, and so these are easiest to target. But others, like diabetes, heart disease, or most cancers, involve hundreds of genes interacting with environment, lifestyle, and chance. Editing one gene won't fix them. There are also diseases caused not by genes, but by viruses, bacteria, or lifestyle factors; and while we could theoretically mutate generations of pathogens to make them harmless, we might accidently cause something much worse than anything we have currently. After all – and this applies in the case of both humans and microorganisms – nature is unpredictable. Fix one mutation, and we might accidentally disrupt another part of the genome. Delivering edited genes to the entire body is also hard; while fixing blood cells or skin cells is relatively easy, reaching the brain or heart is much harder.

So will gene editing cure all diseases? Probably not. But it will cure *many – and o*ver the next decades, gene editing will become one of humanity's greatest medical tools — powerful, precise, and full of potential.

Question IV: How does sacrificial protection from rusting work?

– *Ahmed Muhammed, 15*

Rust is to iron what cancer is to humans. Leave any iron object outside long enough — a gate, a bridge, a ship — and it will crumble into reddish-brown flakes from rust. But we invented a way to protect iron using another metal that "sacrifices" itself. Hence the poetic name: sacrificial protection.

Unfortunately, the metal does not jump in front of the iron and die a heroic death for it; instead, the protection is entirely scientific. Rusting is a chemical reaction called oxidation, where iron loses electrons to oxygen. To stop rust, we need to stop iron from losing electrons. Surprisingly enough, the best method is not to protect the iron from oxygen directly — but to attach another metal that is more willing to lose electrons – that is, sacrifice its electrons. Here comes in the sacrificial anode: usually zinc or magnesium, both more reactive metals than iron. When they are attached to iron, they become donors of electrons – preventing the iron from giving away its own electrons. Because the sacrificial metal oxidizes first, it prevents iron from rusting. It corrodes slowly, turning dusty or pitted, while the iron remains safe and clean. Most of our iron tools are protected this way - ships have zinc blocks bolted to their hulls; oil pipelines run through deserts and oceans protected by magnesium rods; underground tanks stay rust-free thanks to similar sacrificial anodes and galvanized iron is coated with zinc. Even the Statue of Liberty's internal iron frame was saved by sacrificial protection. When iron and zinc are connected and exposed to water, a tiny electrical circuit forms. Zinc becomes the anode and oxidizes. Iron becomes the cathode and is shielded. As long as the sacrificial metal remains, iron does not rust.

This protection is temporary, however; the sacrificial anode is eventually consumed by corrosion. It must be replaced periodically – for otherwise, the iron begins to rust again.

So even though the sacrificial metal may not be a real movie hero, it is the hero of our civilization!

Question V: How did the dinosaurs go extinct?

– Reber Rizgar, 11

For over 150 million years, dinosaurs ruled Earth; great reptiles that shaped entire ecosystems. And then, suddenly, they vanished. What great evil could wipe out most of our megafauna?

The leading answer? An enormous asteroid from the sky. About 66 million years ago, a 10–12 km-wide asteroid slammed into what is now the Yucatán Peninsula in Mexico, carving from the seafloor the 'Chicxulub Crater'. The asteroid hit with the force of 10 billion nuclear bombs. And then?

First came the fire. The collision vaporized rock, sending molten debris shooting out all over the world. As these superheated fragments fell back through the atmosphere, they set forests ablaze in great forest-fires, and millions of animals died within hours. Then came the darkness, for the impact kicked up dust, ash, and sulfur into the sky, blocking sunlight for months or years. Photosynthesis – the engine of life – collapsed. Plants died. Herbivores starved. Carnivores followed. Next came the cold. With sunlight blocked, Earth plunged into a global winter; temperatures dropped sharply; oceans cooled; climate systems faltered. Then, ironically, suddenly came the heat. The explosion released unimaginable amounts of CO_2. After the dust settled, the planet flew into a greenhouse phase, heating up dramatically. Amid all this, massive volcanic eruptions in India – the Deccan Traps – added even more CO_2 and sulfur gases to the atmosphere, amplifying the chaos. Life was hit from all directions: fire, freezing, starvation, darkness, toxic air, climate shock. About 75% of all species died out - including every dinosaur except the small feathered ones that evolved into birds.

So did the asteroid "kill the dinosaurs"? Yes, but not instantly. It created an avalanche of disasters that reshaped the planet. Dinosaurs just couldn't adapt to the disastrous changes - but the mammals could.

The dinosaurs' end was tragic, violent, and world-shaping - but in their ashes, a new future emerged; the one that eventually led to us.

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For these incredible questions and giving us a chance to answer them in the November 2025 issue of YSJOI!

And we thank you, reader, for supporting our mission to help the Iraqi youth where there has been no help as yet!

CONCLUSION

We hope to further YSJOI's mission to empower the youth of Iraq in STEM fields by our monthly magazine, and sincerely hope we were able to help you and other students with this monthly issue! We are always open to feedback and questions, and everyone is of course welcome to learn in their own way; after all, we are all different, and we all belong.

Make sure to visit our website at ww1.YSJOI.is-great.org

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