



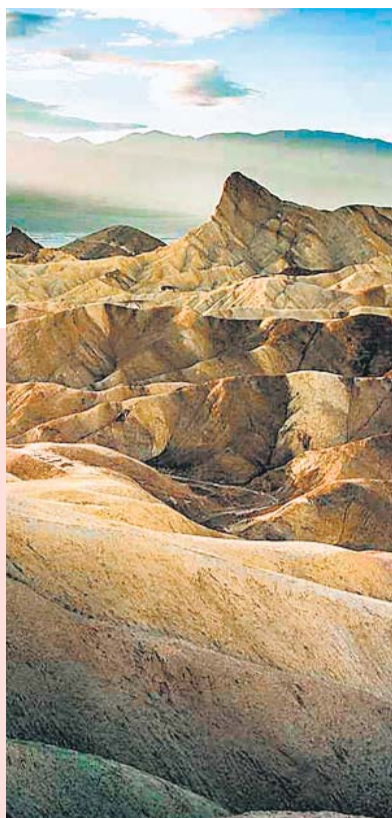
International Day of Light

From X-ray machines, used for health purposes, to microscopes and television screens, used for entertainment purposes, light-based technology has brought all sorts of advances to the world. This includes scientific advancements that have come through light-based tools such as telescopes, cameras, and so much more, in almost every sector of the globe. *International Day of Light* seeks to raise awareness about and shine a bright light on this study and the results, which have changed so much, as it was brought to the modern world!

#AROUND-D-WORLD

Earth's Hottest Places

These locations often feature arid landscapes, with little to no vegetation and minimal water sources.



Earth, our planet, is a diverse tapestry of climates and landscapes, from freezing tundras to scorching deserts. The hottest places on Earth are characterised by extreme temperatures that can easily surpass 50°C during the peak of summer. These locations often feature arid landscapes, with little to no vegetation and minimal water sources. Some of these areas are virtually uninhabitable without proper infrastructure and resources. Here are some of the hottest places on Earth.

Death Valley, USA

Located in California, *Death Valley* holds the title for the hottest place on Earth. Its lowest point, Badwater Basin, sits at 282 feet (86 metres) below sea level. In 1913, it recorded a blistering temperature of 134°F (56.7°C), which remains the highest reliably recorded air temperature on Earth. Summers here are brutal, with temperatures often exceeding 120°F (49°C), making it an extreme environment for life.

Dasht-e Lut, Iran



In southeastern Iran lies the *Dasht-e Lut* desert, one of the driest and hottest places on the planet. This vast salt desert holds the record for the highest land surface temperature ever recorded, a scorching 159.3°F (70.7°C) in 2005. Its unique terrain, including vast sand dunes and salt flats, adds to its otherworldly appeal.

Dallol, Ethiopia



Dallol, a remote volcanic crater in the Danakil Depression of Ethiopia, is one of the hottest inhabited places on Earth. With year-round average temperatures, hovering around 94°F (34°C) and occasional highs reaching above 120°F (49°C), it's also one of the most inhospitable. Its landscape is surreal, with colourful hot springs, acid pools, and salt formations, creating an otherworldly scene.

Oodnadatta, Australia



Oodnadatta, situated in the Australian Outback, is renowned for its extreme heat. With summer temperatures regularly surpassing 120°F (49°C) and occasionally reaching over 130°F (54°C), it is one of the hottest inhabited places on Earth. The area's arid terrain and sparse vegetation amplify the oppressive heat, making it a challenging environment for those who live there.

Kuwait City, Kuwait



Kuwait City experiences scorching summers, with temperatures often exceeding 120°F (49°C) due to its location in the Arabian Desert. The combination of high temperatures and high humidity levels can make it feel even hotter. Air conditioning is a necessity, and outdoor activities are typically limited during the peak of summer.

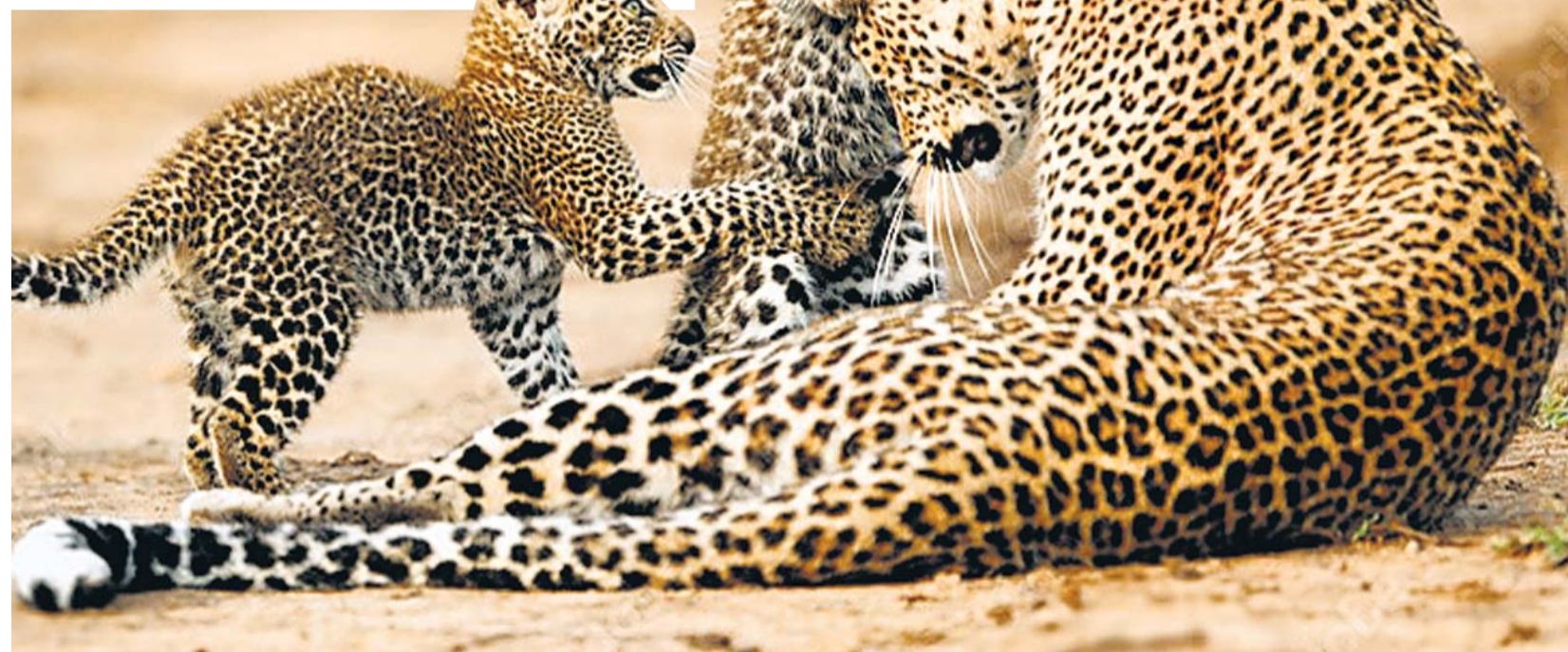
Maybe, she changes her plan and return back to the cubs, left unsecured on the kill site. The distance had reduced to few meters and perhaps, our thumping heartbeats could reach the cat now and we had no option but to pray to the almighty to save us from this deadly animal, and then, suddenly from the kill site, an alarm call hit our ears. At this distance, the leopard mother was almost in full view to us inspite of the dim moon light. The call froze her legs. She immediately turned towards the kill and ran fast towards the kill site. Certainly, it was frightening call from the cubs, indicating they smelt some danger. And then, what we witnessed was something unimaginable. Now, there was another animal on the kill site. Within seconds, the mother leopard took this new intruder by surprise. She growled at this invader with a frightening sound.

Close Shave Of The Worst Kind

PART: 2



Striped Hyena, on night patrol for some kill.



Striped Hyena, on night patrol for some kill.



Sunayan Sharma
IPS (Retd.), Ex-Field
Director, Project
Tiger Sariska &
Keoladeo National
Park, Bharatpur

decided that after collecting the material, he may proceed with pitching the tent and I shall meet him there only later.

In the meantime, Sukkha had arranged a glass of tea for me and *mahua* liquor for his neighbours in a bottle. They sat surrounding me on the floor and started pouring their favourite drink from this bottle in an old ordinary clay cup. I vividly remember that they finished the first serve in five minutes and two more fills in next ten minutes, pretty quick to be sure, but they were ready to come along with me as soon as I finish my tea.

By now, sunlight had dimmed in this part of *jungle*, and I started back towards Kala Khet kill site, along with this group of 4-5 *junglmen*. Sukkha's hut was at the top of the hillock and below this, up to hill's base, was spread his *khet* (farm), presently lying bare, except for some grass tussocks, here and there. He had not bothered to create terraces to stop soil, water erosion from his land, as practiced largely in the hilly

on the bank of the dry river. He knew someone on the dam site, who could provide this tent. He immediately rushed on his bicycle with a trusted tribal youth.

It was already five in the evening and Mathuralal was expected to take time in reaching back with the tenting provisions, therefore, it was



The meandering hilly river.

areas of Himalayas and Sivaliks. Basically, these *Mewar* tribals are not much interested in farming, and have not bothered to learn such arts and techniques.

Sukkha's hut and farm were surrounded by dense growth of almost pure bamboo clumps. As winter was still lingering in this area, and with the sun down, the highly oxygenated thin air, here, was getting really cold by the minute. I was lucky to be equipped with a full-sleeved woolen jacket. Thanks to wise Mathuralal, who persuaded me to carry woollens on this trip.

Towards South, at half-a-kilometer in the *Bhairava* forest block only, stood a well-stocked patch of *khair* (*Acacia catechu*) trees. *Katha*, an essential ingredient of *paan* (betels) is manufactured by boiling heart wood chips of this tree. For this unique utility, this wood had always been in high demand for *katha* manufacturing industries. And therefore, its protection in *jungles* had always been a serious challenge for the forest personnel. Fortunately, this forest was not much exploited but for fuel purposes by the locals.

By the time I finished this inspection, light had departed completely and the tribals with me suggested to me to light *marshals* but I refused, as I did not want to take any risk of disturbing the leopard, expected to approach its half-eaten kill at Kala Khet, any time from now. I took out a torch from my haversack, which I used to carry invariably, on every *jungle* trip. We were not much far from the tent site that suddenly, a terrifying hooting call from our North surfaced. It was dreadful at this dusk hour, which was otherwise totally silent. After five minutes, it repeated once again. For sure, there was some big *owl*,

#WILD



Cubs love playing in water but mother keeps them under discipline.

may be the 'Great Horned,' now on its hunting errand. Reaching the site, I found that Mathuralal had not only pitched the single ply tent but had arranged an all-bamboo cot, too. Also, a mattress was spread on the coat, its unbearable foul smell filled my nostrils and mind. Passing a night on this mattress was like sleeping by a putrefying animal carcass. I rushed out immediately in search of fresh air and sucked it deep into lungs, yet, the pungent smell did not leave my mind.

Mathuralal was still talking to his aide while others were gossiping that clothes were insufficient for the night stay. They suggested that either they should have sufficient bedding, especially blankets or quilts, or keep bonfire on throughout the night. The Mathuralal's aide offered to collect these essentials from *Barwarda* village, about two kilometer from here. Also, the smart boy started immediately on cycle to be back as early as possible. Outside, chill was increasing rapidly

but with cautiousness, lest it disturb the cat. Reaching bit close to the site, we hid ourselves behind a big rock and now, I could clearly see that there were two more sets of small bulb like lights, along with the bigger one.

Mathuralal immediately yelled, "*Hokum!* Leopard is with two cubs." I immediately threw light to confirm and witnessed the rare sight of the *mother leopard*, with her 5-6 months old *cubs*, devouring the kill. They might have been eating for quite some time because major portion of the kill had been finished by the family.

Mathuralal's loud voice and my torch light had disturbed the mother leopard, who immediately withdrew from the kill into a little shade while the cubs, unaware of any threats, continued eating and playing gamboling over the kill. They did not seem too hungry and were more in play mood. I was absorbed in sighting playful activities of these little spotted creatures and, altogether, forgot about the mother, who had slipped from there. But alert fieldman, my aide, cautioned me to check the mother.

This time, I threw light on the left of the carcass, and there, spotted the mother with two of her eye bulbs emitting red and white light. She immediately turned her gaze at us, the source of the light with baleful eyes for intruding her privacy, especially when she was with her cubs on the kill. Also, she mewled in annoyance at us, the unknown intruders. Her countenance was dreadful to behold. I switched off the light immediately, to not invite any trouble. Once again, there was silence in the atmosphere but for the sound from the cubs feeding on the kill or our heartbeats.

Now, seeing the danger abated, we came out of the shelter and under the torch light, we could clearly recognize this intruder, a fully-grown up *striped hyaena*. The hyaena dragged back its feet, emitting displeasure vocalization for being denied the feast on the carcass. The leopard mother pushed the scavenger several feet till it took a U-turn and then vanished in the *jungle*. The mother came back to the cubs, who had cuddled each other for fear of attack by the intruder.

Mathuralal suggested me to silently move back to the safety of our tent and we did so, but the big question of problem from the leopard was still alive. After it was confirmed that the leopard had little cubs, who could not survive without the mother's care, capturing and relocating the adult cat could not be a solution as capturing all the three cats in one cage was impractical.

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Tribals enjoying *Mahua* liquor party.

Suddenly, some stone rolling kind of sound erupted from our right side in the riverbed. I threw my torch light in the direction and found the leopard mother, treading through the dry riverbed, towards us. Obviously, the mother, very sensitive about her cubs' safety, disliked our presence, the wind in her favour, bearing our body odor was to her aid. Blood froze in our hearts, seeing the dreadful animal moving towards us with cautious steps that it uses while stalking a quarry.

When distance between us had reduced to just 25-30 meters, Mathuralal proposed to run towards our tent site, but I declined as exposing ourselves in such an open area to the leopard, with cubs on feed, could be more risky. With every advancing step of the cautious cat, our heart was thumping at tremendous pace as if it was about to come out of its cavity any minute, yet, we had no option but to take a chance with the animal.

Maybe, she changes her plan and return back to the cubs, left unsecured on the kill site. The distance had reduced to few meters and perhaps, our thumping heartbeats could reach the cat now and we had no option but to pray to the almighty to save us from this deadly animal, and then, suddenly from the kill site, an alarm call hit our ears. At this distance, the leopard mother was almost in full view to us inspite of the dim moon light. The call froze her legs. She immediately turned towards the kill and ran fast towards the kill site. Certainly, it was frightening call from the cubs, indicating they smelt some danger. And then, what we witnessed was something unimaginable. Now, there was another animal on the kill site. Within seconds, the mother leopard took this new intruder by surprise. She growled at this invader with a frightening sound.

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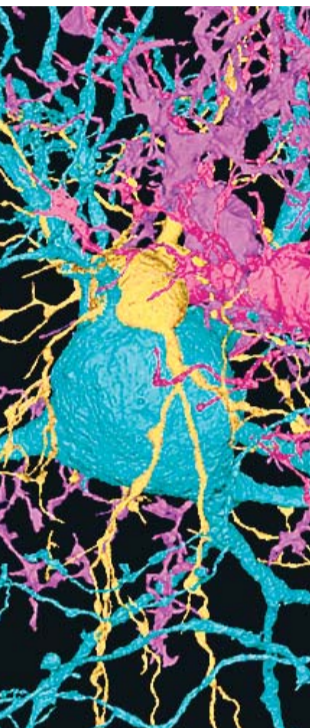


Sitamata Sanctuary is full of Teak forests.

#BRAINPOWER

Epic Science inside a cubic millimeter of Brain

The latest map contains never-before-seen details of brain structure, including a rare but powerful set of axons, connected by up to 50 synapses. The team also noted oddities in the tissue, such as a small number of axons that formed extensive whorls.



A cubic millimeter of brain tissue may not sound like much. But considering that this tiny square contains 57,000 cells, 230 millimetres of blood vessels, and 150 million synapses, all amounting to 1,400 terabytes of data, Harvard and Google researchers have just accomplished something stupendous.

Led by Jeff Lichtman, Professor of Molecular and Cellular Biology and newly appointed dean of science, the Harvard team helped create the largest 3D brain reconstruction to date, showing in vivid detail each cell and its web of connections, in a piece of temporal cortex about half the size of a rice grain.

The study is the latest development in a nearly 10-year collaboration with scientists at Google Research, combining Lichtman's electron microscopy imaging with AI algorithms to color-code and reconstruct the extremely complex wiring of mammalian brains. The paper's three first co-authors are former Harvard postdoc Alexander Shapson-Coe, Michal Januszewski of Google Research, and Harvard postdoc Daniel Berger.

The ultimate goal is to create a comprehensive, high-resolution map of a mouse's neural wiring, which would entail about 1,000 times the amount of data that the group just produced from the 1-cubic-millimeter fragment of human cortex. "The word 'fragment' is ironic," Lichtman said. "A

terabyte is, for most people, gigantic, yet, a fragment of a human brain, just a minuscule, teeny-weeny little bit of human brain, is still thousands of terabytes."

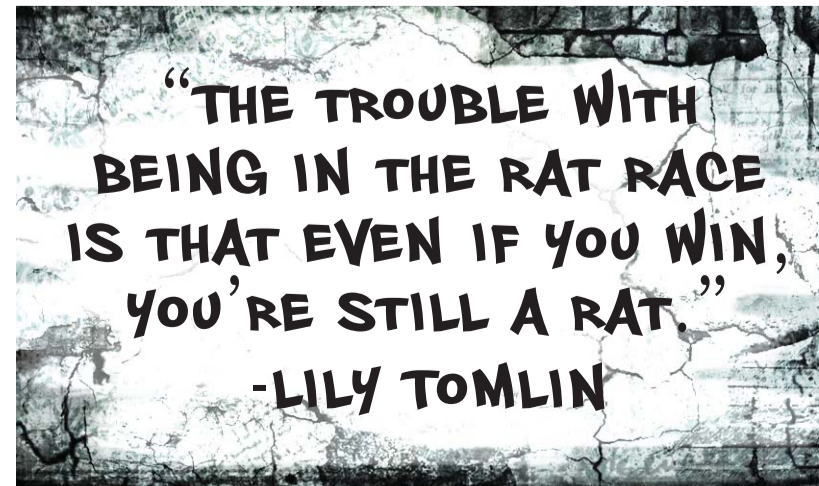
The latest map contains never-before-seen details of brain structure, including a rare but powerful set of axons, connected by up to 50 synapses. The team also noted oddities in the tissue, such as a small number of axons that formed extensive whorls. Because the sample was taken from a patient with epilepsy, the researchers don't know whether such formations are pathological or simply rare.

Lichtman's field is connectomics, which seeks to create comprehensive catalogues of brain structure, down to individual cells. Such completed maps would unlock insights into brain function and disease, about which scientists still know very little.

Google's state-of-the-art AI algorithms allow for reconstruction and mapping of brain tissue in three dimensions. The team has also developed a suite of publicly available tools that researchers can use to examine and annotate the connectome.

Given the enormous investment put into this project, it was important to present the results in a way that anybody else can now go and benefit from them," said Google collaborator, Viren Jain. Next, the team will tackle the mouse hippocampal formation, which is important to neuroscience for its role in memory and neurological disease.

THE WALL



BABY BLUES



By Rick Kirkman & Jerry Scott

ZITS



By Jerry Scott & Jim Borgman