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Mind your reflection

When you look into a mirror, you know that your reflection isn't another person. Many scientists wonder if other animals also have this ability.

Understanding your own thoughts and feelings is described in psychology as the 'theory of mind'. Some scientists believe that if an animal recognises its reflection, it is showing signs of a theory of mind.

To use a mirror to test an animal's theory of mind, scientists put animals in front of a mirror and let them look at their reflection. The scientists then remove the mirror and put a coloured dot on the animal's body before bringing the mirror back.

The animal can only see the dot when looking in the mirror.

If they touch the dot on their own body after seeing the reflection, the scientists assume that the animal identifies the image in the mirror as theirs, and not belonging to a separate animal.

Many animals, such as dogs, can pass the mirror test, as well as chimpanzees, dolphins and even magpies.

Frogs don't recognise their own reflection

The mirror test might sound easy, but even humans can't pass the test until they are at least 18 months old. So the next time you look in the mirror, remember that it wasn't always so easy!

TEACH THAT OLD DOG SOME TRICKS

NATIONAL AWARDS RECOGNISE 'GOOD EGGS'

WHALING REPORT FUTILE - RSPCA

IT'S BACK! RSPCA ANIMAL WALK

WHAT'S IN IT FOR THE HORSE?

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RSPCA APPROVED FARMING

SAY NO TO CROCODILE HUNTING

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MEMORIAL TO ANIMALS IN WAR

THE REAL VALUE OF ENVIRONMENTAL TOURISM

RSPCA OPPOSES CROCODILE SAFARI HUNTING IN NT

The RSPCA is strongly opposed to the introduction of safari style hunting in the Northern Territory. The RSPCA believes that allowing crocodiles or any Australian native wildlife to be hunted for trophies and commercial gain is unacceptable.

"There is no possible conservation benefit to be derived from the killing of crocodiles for trophies, nor does it provide a means of controlling problem crocodiles," said RSPCA Australia Chief Scientist Dr Bidda Jones.

"This is nothing more than killing animals for entertainment and there is no justification for that. The culling of saltwater crocodiles should be firmly in the hands of trained and competent professionals, not tourists whose only aim is to bag another trophy to show-off back home."

"There is no evidence that safari hunts will provide income to Aboriginal landholders and any economic arguments should not overrule the ethical welfare arguments against the killing of animals for sport."

RSPCA Australia has long opposed the hunting of animals for sport because of the potential for cruelty and the extreme difficulty in enforcing animal welfare legislation in remote areas. Successive federal environment ministers have rejected similar proposals for safari hunting, concluding that this is not a suitable approach for the responsible management of crocodiles in the NT. This decision, unfortunately, may change in the future.

Malaria's ancient mask

With its belly still full of the blood of ancient animals, the 100-million-year-old mosquito was like a tiny window peering back through time. Only it wasn't the genes of long extinct reptiles that scientists in the United States were interested in, but a type of parasite called *Plasmodium*.

These microscopic organisms cause the disease malaria. According to the World Health Organisation, malaria kills roughly one million people a year. The parasite enters red blood cells to reproduce, popping the cells and causing anaemia and fever.

While there are treatments for malaria, coming up with a vaccine has been rather difficult. Vaccines provide the body's immune system with some idea of what a micro-organism looks like. Unfortunately, *Plasmodium* has a rather clever trick up its sleeve that allows it to deceive immune systems.

The outer membrane of the parasite changes its chemical features over time, just like the virus that causes the winter sniffles. It's therefore hard to come up with a vaccine that can tell the body what all *Plasmodium* parasites look like.

By extracting parasite material from mosquitoes trapped in amber, American researchers have discovered that its ability to change is no recent talent. The preserved parasite shows malaria has plagued a variety of animals for millions of years, slipping past different immune defences with its molecular disguise.

Trapped in amber[1], this bloodthirsty insect holds the key to malaria's secret.

Given its deadly effects, seeing an end to this ancient parasite may seem like a good thing. But would the extinction of an organism that has been round for at least 100 million years be something to celebrate?

[1] Amber is fossilised tree resin.

Encounter in Castle Estondrake

Ayleth and William stood very still, each studying the other with a dispassionate gaze. Ten years had passed since they had seen each other and if they recognised each other now, it could not be perceived on their faces.

Here in the depths of the stone passageways under Castle Estondrake, there was no-one close by. No-one to hear a call for assistance. No other soul nearby. Now they were face to face.

Ayleth, the former queen of her island empire, was tall with fine, hard features. Her flawless face framed penetrating eyes that shone with deep emerald intensity. Her ebony hair was pulled back and plaited tightly in a manner befitting her once regal status in her now enemy-occupied homeland. She had spent the last decade in restless exile, gathering her loyal followers from far-flung regions of the known world, from distant islands in distant seas where they had been forced to flee in the last years of the struggle against the enemy from the cold North. She convinced them that the cause was still alive, that, with determination, strength of will and large doses of cunning, they could wrest their homeland back and restore their paradise home to its citizens.

And now, here she was in the enemy's main stronghold with a small, hardy band of her finest fighters. They had slipped into the castle through a little-used access gate fronting the river; one that had seemed all but forgotten by the defenders and protectors of the bastion. Ayleth had not expected any encounter with the enemy in this part of the fortress. Even less had she expected to meet the one person from her home who had once been her closest and most trusted advisor—indeed the one person she had once claimed as her only true friend.

As she had rounded a corner, a soldier in the uniform of the enemy had been striding along the gloomy corridor in her direction. At first he hadn't seen her, a map held in front of him consuming all his attention. The shock of meeting anyone at all in this part of the castle had made Ayleth momentarily lose her concentration. Rather than swiftly retreating before being detected, she had paused long enough for William to raise his head.

It was William who spoke first.

Being a vegetarian

Make up your own mind

Being a vegetarian in a predominantly meat-eating culture isn't always easy. I always get asked the usual, "Why? Since when? How come?" and my favourite, "How can you stand not to eat meat?"

For me, being a vegetarian isn't strange; it's just who and what I am. I'm sick and tired of people judging me based on a personal choice that has nothing to do with them. Honestly, I could understand if my conscious decision had an impact on their lives, but the thing is it doesn't, so they should just get over it.

If anything, more people should be vegetarian. It's a fact that there is a range of health benefits associated with being vegetarian. Some of these benefits include a lower risk of cancer, heart attacks, high cholesterol and hypertension. Being a vegetarian can prolong your life because you are eating healthily and not consuming the saturated fat and cholesterol that can be found in non-vegetarian diets. While all diets need to be balanced, it is possible to obtain protein, minerals and nutrients from vegetable sources, though admittedly in lesser quantities. Vegetables, dairy and eggs contain virtually all the requirements your body needs to survive.

If you are creative, a vegetarian diet is far from boring. As vegetables have a variety of types, textures and tastes, they can be prepared and eaten in countless ways. The plethora of vegetarian cookbooks is testimony to this fact. You can also grow your own vegies, which is very satisfying.

I find it hilarious when people say that vegetarians do not get enough energy from their diet. My response is to casually mention Dave Scott, the first person to win the Ironman Triathlon World Championship ... six times! Yes, surprise, surprise, at the time he was a vegetarian.

Vegetarianism is better for the planet because the ecological footprint of vegetarians is smaller. So next time you want to criticise someone's personal choice to go vegie, remember that they have their reasons, not the least of which are concerns for animals and the state of the planet.

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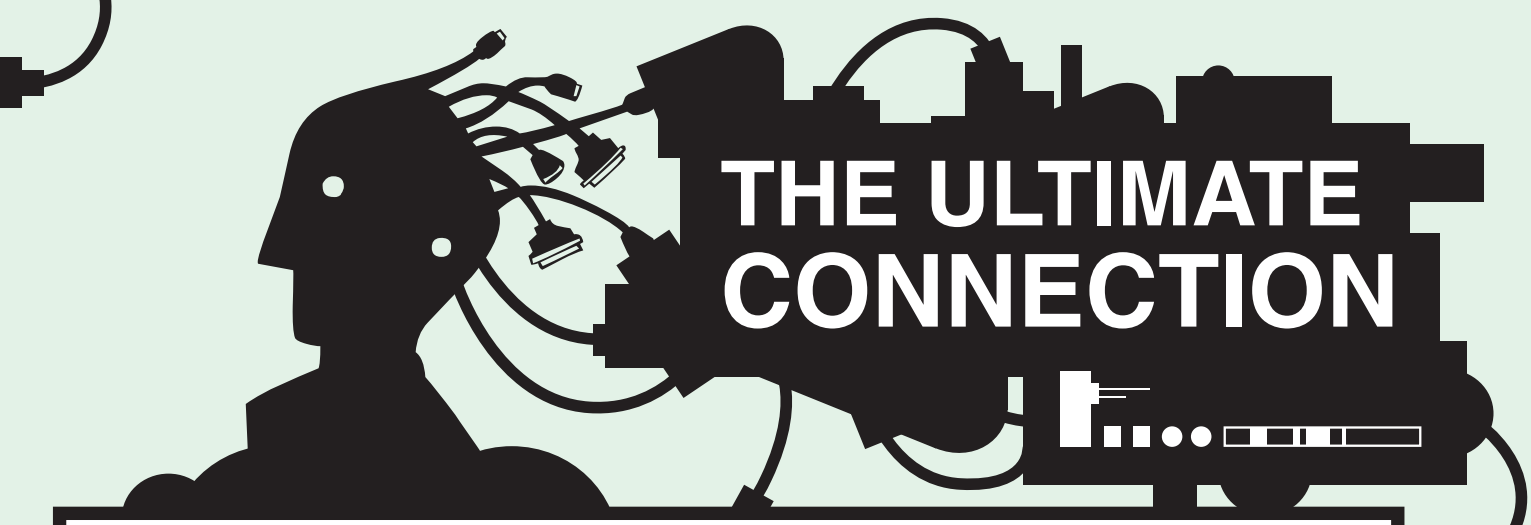
In the moment

I remember the evening. The heat. The waiting and the anticipation of my father's return. My mother made sure the house gleamed. Nothing out of place. Red orchids arranged symmetrically in the deep green vase. How long he'd been gone I couldn't be sure. Could I even be sure what he looked like? Yet, his familiar smell hung in the air. His clothes. His neat rows of books. His trophies and accolades. Finally, in our starched and ironed white cotton pyjamas we surrendered to sleep. I'm sure, much later, I heard my father arrive home. The happy sounds of my parents chattering into the night soothed the oppressive heat and comforted my soul.

The heat of the morning sucked me into my bed, suffocating me. As I opened my eyes I saw with delight the parchment my father had laid out for me. He had been promising to buy me parchment for some time and there the pile lay, cream and crisp and beautiful. Beside the pile my crayons lay like a bouquet of spring blooms. I looked across and saw Aki still sleeping so peacefully. When he stirred I set out our paper and crayons. My mother's kimono hanging at the back of the door. A rainbow of colours that would consume me for some time. I remember the waxy red crayon majestically bleeding across the page. Such perfect pure colours. Next cobalt blue. And emerald green, contrasting against the golden woven stripes. Aki had joined me silently, both intoxicated with the parchment, and the colours of the crayons and the kimono. Aki focused his design on just a tiny piece of the pattern. He always looked at life as if through a magnifying glass. He saw the intricate detail that I missed with my enthusiasm and quick strokes. He meticulous; me wild with excitement. We were lost in our thoughts for perhaps an hour and the parchment had come to life. It would soon be time for school.

In another moment our lives would be changed forever.



THE ULTIMATE CONNECTION

Science fiction books and movies feature futuristic notions such as machines taking over the world, or a world where computers know what people think. It's a step beyond the neuro-technology that we have today, but how big is that step?

Innovation relating to brain-computer interaction (BCI) may well have narrowed this gap significantly.

In 2010, an interface was released that reads brain signals and translates them into language that a video game can understand. This interface — called a neuro-headset — comprises a headset mounted with sixteen sensors which detect facial expressions and head position and which also tune into the brain's electrical signals using electroencephalography (EEG) technology. This technology has been widely used in medicine as a diagnostic tool since the 1950s and its use in brain computer interfaces has been explored since the 1970s.

The neural signals are transmitted wirelessly to a computer where sophisticated software matches them up to the user's thoughts, feelings, expressions and intentions. In this way, the software learns what each user's brain activity looks like when a person imagines performing actions such as a left turn or jump. Then, when a player smiles or thinks about running, their avatar mimics them.

Such neuro-technology has the capacity to integrate humans and machines. Developers of BCI are working on applications for disabled people so they can control electric wheelchairs, computers and games with their minds. Bypassing damaged senses and connecting directly to the brain, neuro-technology might allow blind people to see, deaf people to hear and quadriplegics to walk. It could enable us to instantly communicate with anyone, anywhere. If the technology were used with groups, teachers could know how their students are feeling and doctors would be able to monitor patient health.

But what would they do with that information? Would you want everyone to know your thoughts, intentions and emotions? And if a computer is vulnerable to hacking, what happens when a brain is linked to the system? Could consciousness be hacked? The possibilities of neuro-technology are limitless. We live in exciting, but also concerning times.

Going somewhere

The man in the suit was going somewhere. That was how he strode into Laurie's mind the first time, ten months before — a man going somewhere. Laurie took in the coppery hair and beard — were they stylish or unkempt? The eyes were disconcertingly blue, not settling on anything near, focused only on something distant — the place he was going. His suit was unmistakably good. To Laurie — at fifteen, transplanted by his parents from the country to the inner suburbs, wandering his new streets, marvelling at the unearthly blue of the jacarandas and the fleshiness of the suspended mangoes — the man appeared as a sign. He was going somewhere.

Laurie continued to explore his streets in those early months, even as school took over and friendships developed. The deep, damp shade, the searing light, the older houses slumping in the green shadows — it all became his own. But not his alone. He shared it with the man in the suit. He met him at every corner. While Laurie studied the lichen-encrusted palings of a collapsing fence, or the blood-red flowers of a flame tree, the man would stride past, going somewhere. But the hair and beard were now definitely unkempt; the eyes were brighter.

Laurie felt a kind of fellow feeling. By now he was convinced that he was going somewhere too. The move to the city had been a success. He felt he should acknowledge his friend, his fellow explorer — just a nod of the head. But he never did.

The man continued to change. Were those twigs in his hair? Whatever the eyes were fixed upon was more distant. The suit became dirty; then ragged. Laurie had admired the man's sense of purpose. Now he seemed like a frantic insect in a mango tree, tossed between light and shade. And now, whenever he was tossed into the light of Laurie's vision, Laurie looked away.

After almost a year in his new city, Laurie was sitting on a seat in the park, reading. It was the smell he noticed first. He looked up. The man in the suit was in front of him, standing still — but somehow standing with the same concentrated energy with which he always walked. His ravaged eyes were focused on Laurie. Was there any recognition there? There was no sign of it. Laurie and the man looked at each other. The blue of the man's eyes was like a strange, brittle mineral.

Laurie was sickened by the animal smell. Animal? No, he realised, as a sense of menace thickened, it was not an animal smell. It must be human. And the light in the eyes too?

The man spoke. Just one wordless noise. Then his concentrated energy drained from him, and he slumped onto the seat beside him. Wherever the man had been going, he seemed to have arrived.

They sat side by side, Laurie wondering how he could leave, how he could stay. Finally he got to his feet and without looking back said, 'Um … I've … somewhere to go.' And he walked off, quickly. If the man made any response, Laurie didn't hear it.

He kept walking, faster, faster. But he had nowhere to go.

END OF READING MAGAZINE

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