Resilience

Lokusdesign

prologue

At Lokusdesign, we design to reduce Entropy and inspire positive action. In doing so, we bring greater resilience to systems, brands, spaces, and experiences. And this is critical to sustenance and growth in a world of all-pervading volatility, uncertainty, complexity, and ambiguity.

If you look carefully, you'll find examples of resilience all around- from nature to sciences, to philosophy, to legends... This booklet is intended to highlight just a few. We sincerely hope that within these, you too will find inspiration for enhancing the resilience of systems, brands, spaces, and experiences around you.

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bending branches

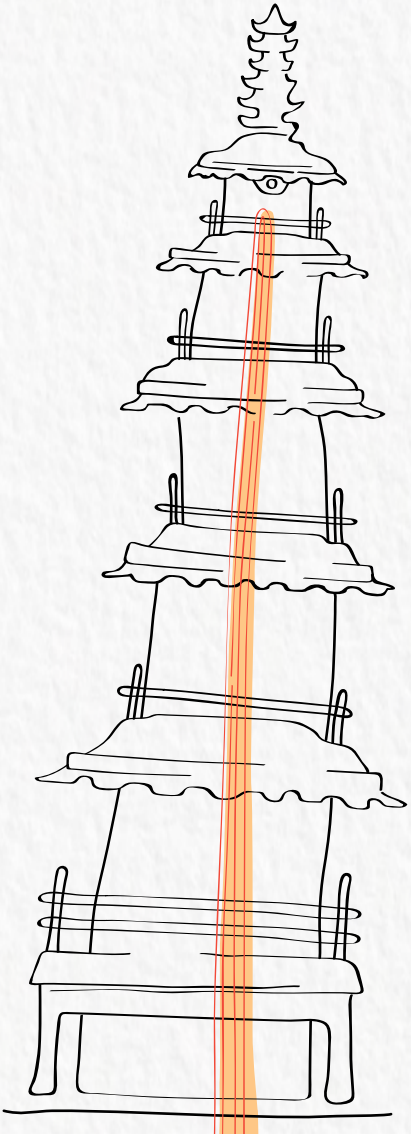
Resilience in nature

In snowfall, snow clumps on the tree branches, building a forest of white. But branches can only take so much weight. So when the snow becomes too much, the branch gently bends, relieving itself of the snow and its weight.

japanese radio towers

Resilience in architecture

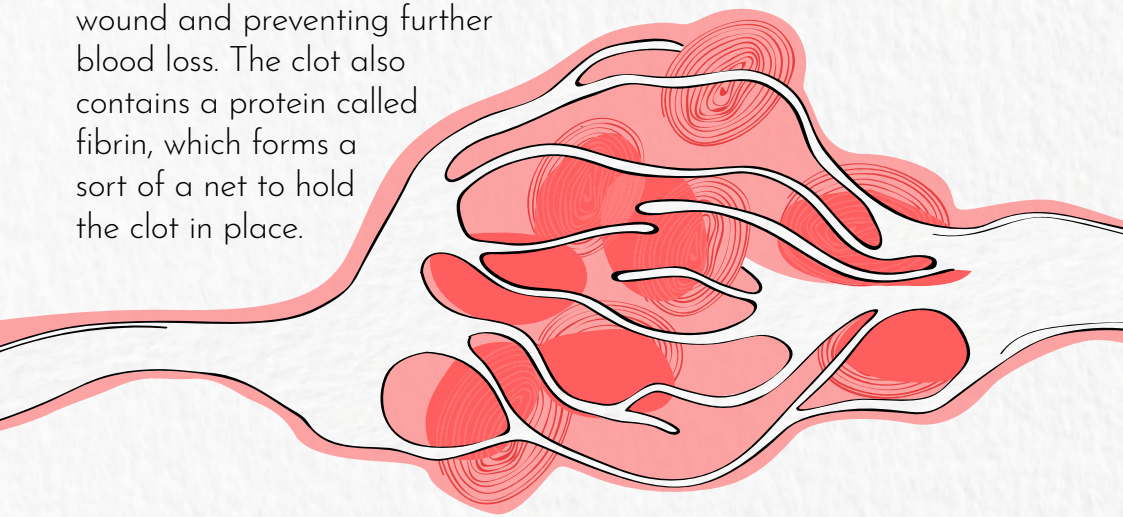
The key design feature of Japanese Radio towers is the concrete central column, which acts as a center of gravity. In the event of an earthquake, it moves independently of the tower- counterbalancing and suppressing swaying motions and cancelling vibrations- to hold the building from collapsing.



blood clotting

Resilience in human biology

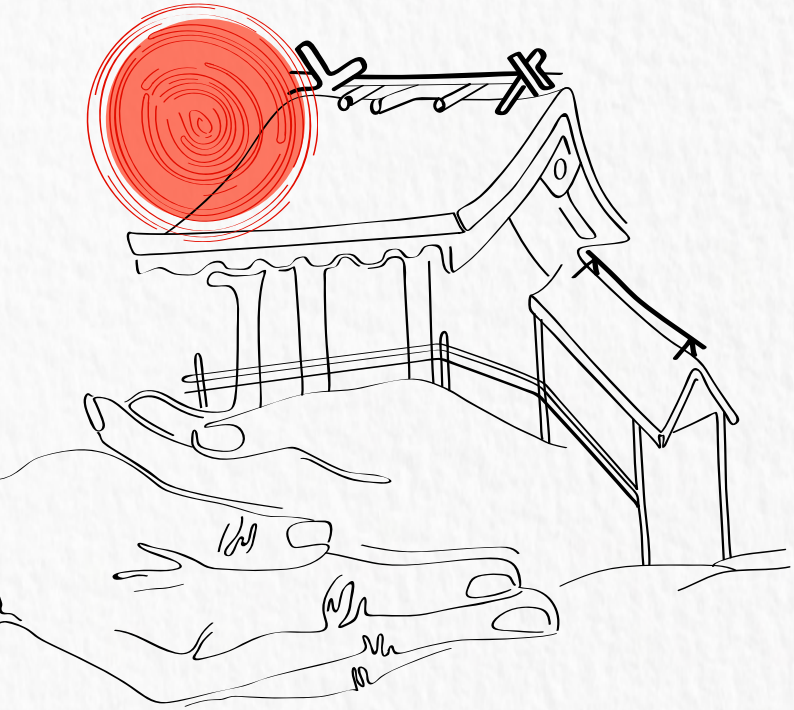
When our skin gets cut, we start bleeding. But our body's active response mechanism ensures that within minutes (or even seconds), our blood cells start to clump together and clot, protecting the wound and preventing further blood loss. The clot also contains a protein called fibrin, which forms a sort of a net to hold the clot in place.



reorienting flowers

Resilience in plant kingdom

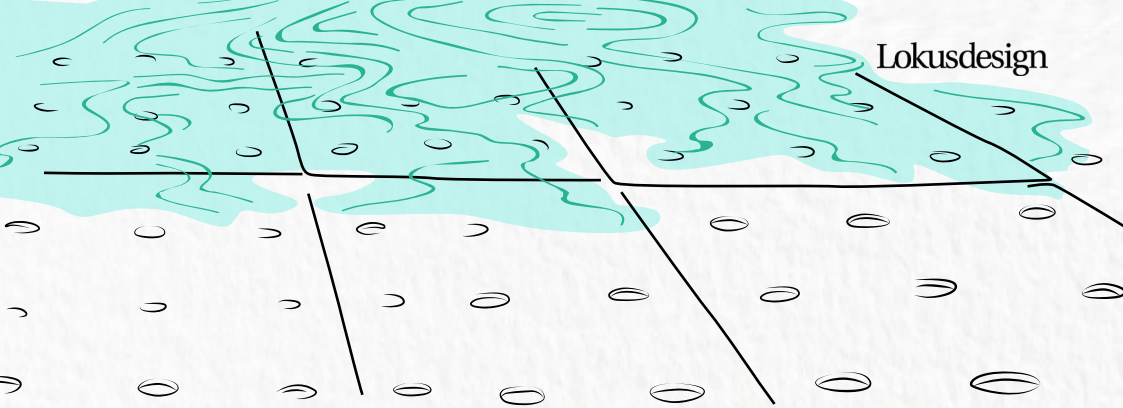
It is essential for a plant's stem/ branch to stay right side up so that it can keep its flowers pointing outwards as it gives a perfect landing platform for bees to pollinate. But when the stem falls down due to wind/ rain/ falling branches etc. (the plant is still alive!) the flowers which go sideways/ up-side down, respond by reorienting themselves to again give the perfect landing platform for bees.



Ise Jingu shrine

Resilience in tradition & skill

The Ise Jingu Shrine in Japan is torn down and rebuilt to the exact same traditional specifications and method, every 20 years- for the past-2000 years! This repetitive practice of undoing and redoing has ensured that the traditional construction skills and methods withstand the sweeping winds of time.



The Climate Tile is a street paving system in Copenhagen that aims to reduce street flooding. It is dotted with holes that allow it to collect and manage water, funnelling some of it into planted space alongside the pavement. It serves as a supplement to existing drainage systems, easing the stress on sewers at a time when some cities are recording record rainfall. That apart, it also transforms the formerly grey road verge into a green strip with trees and other plantings enhancing the mood of passers by and improving the microclimate.

Klimaflisen
(Climate Tile)

Resilience in urban planning

camouflage

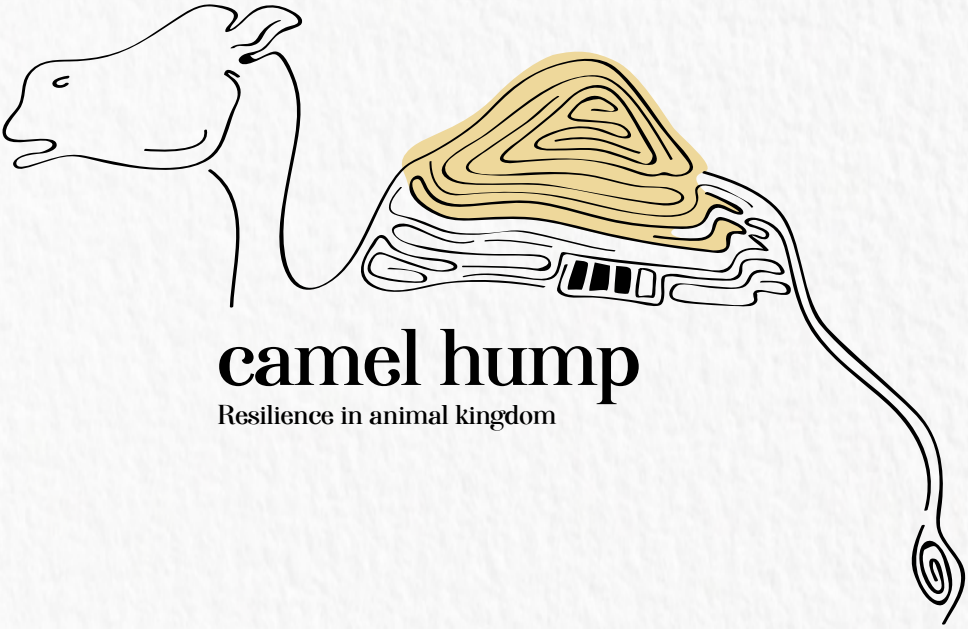
Resilience in nature & military

Camouflage or cryptic colouration is a defense mechanism that helps insects blend in with their surroundings. Small insects often use camouflage to deceive their prey or conceal themselves from predators. The same phenomenon also drives resilience among military personnel (uniform etc.), equipment, and installations during war.

Concrete is one of the most commonly used building materials, and it is prone to cracking. From large crack to very small hairline fractures, cracks weaken the structural integrity of concrete. Engineers have developed self-healing concrete by mixing bacteria into concrete to create a bio-concrete. The bacteria grow into cracks as they form, releasing calcium carbonate as a waste product, which fills the crack.

self-healing concrete

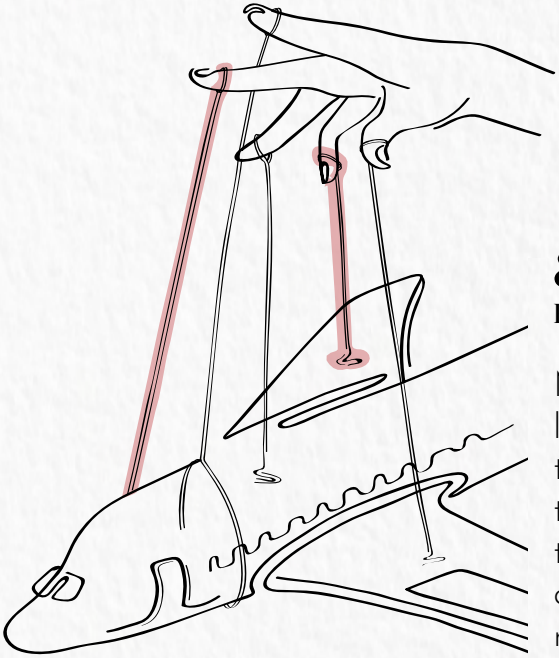
Resilience in materials



camel hump

Resilience in animal kingdom

When food and water become scarce, the camel extracts energy from its hump. This odd protrusion on the camel's back is actually a mound of reserve fat, which allows the camel to travel days through the desert without stopping for a bite to eat. The longer a camel goes without eating or drinking, the more visibly deflated its hump becomes. But give it adequate water and food, and camel humps plump up in a matter of days.

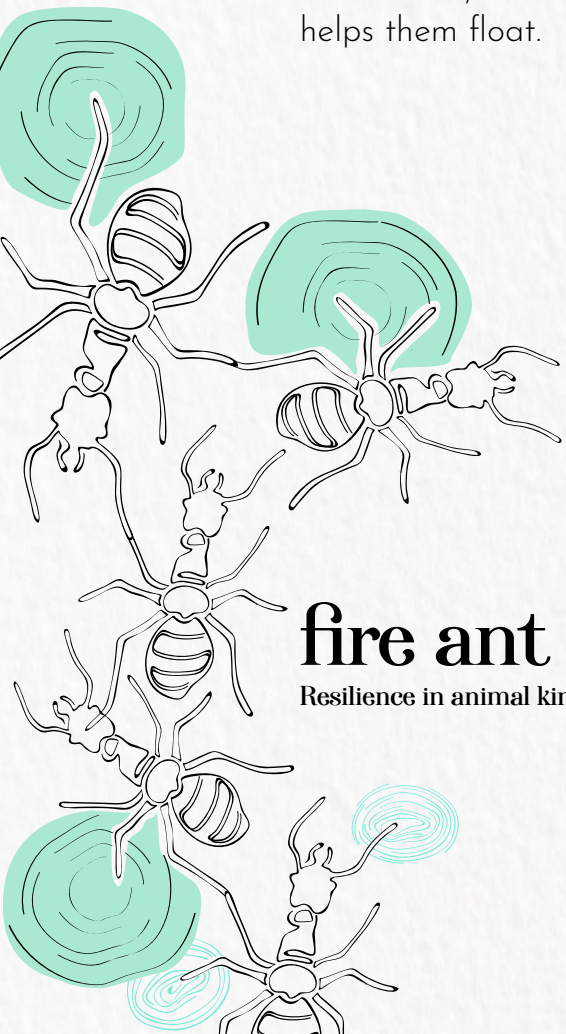


aircraft design

Resilience in engineering

Many functions performed by large airplanes are vital to their proper functioning; and thus to passenger safety. Given the potential consequences, airplane manufacturers build resiliency into the very design of airplanes by incorporating variation, redundancy, and decentralization across the board. For example, there are diverse operating mechanisms (e.g., electrical, mechanical, hydraulic, and pneumatic) for all critical functions (e.g., engines, landing gear, navigation). The manufacturers of the parts are all different, and there are at least three versions of each system, which are widely distributed throughout the plane.

Fire Ants live underground, but when it begins to flood, they gather the colony members and build a floating raft using their own bodies as building material. These rafts are a combination of solid and fluid when stressed by forces at all speeds. They actively deform to accommodate stress (like a fluid) but then bounce back into place afterward (like a solid). When many ants clump together to form a structure, water doesn't penetrate into the gaps between them. And when they're forced underwater, the air that remains in these cavities, helps them float.



fire ant rafts

Resilience in animal kingdom

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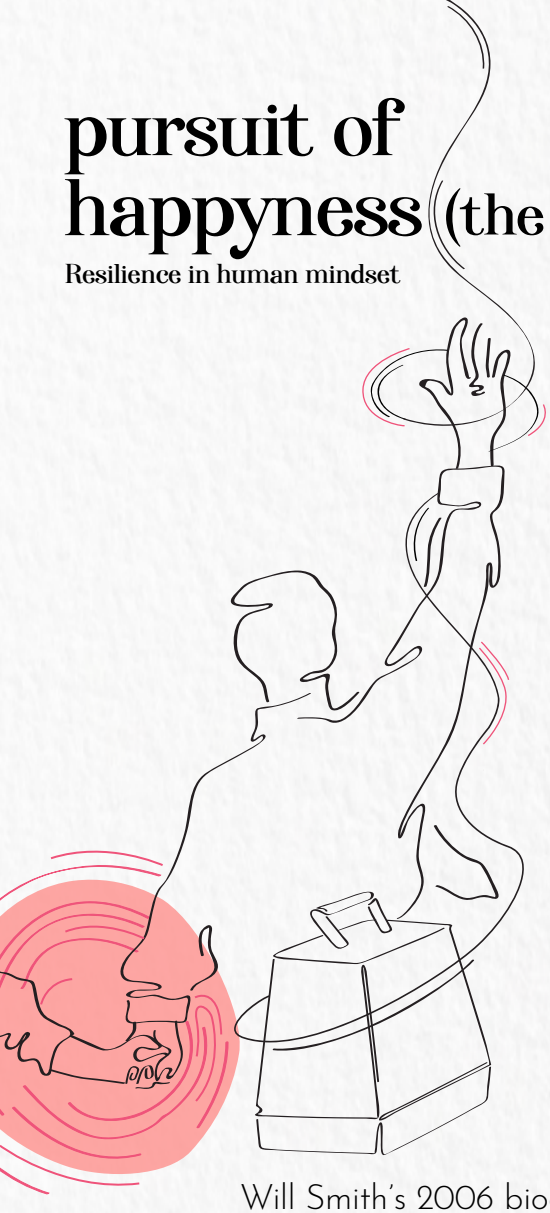
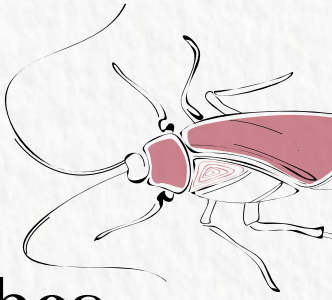
pursuit of happyness (the film)

Resilience in human mindset



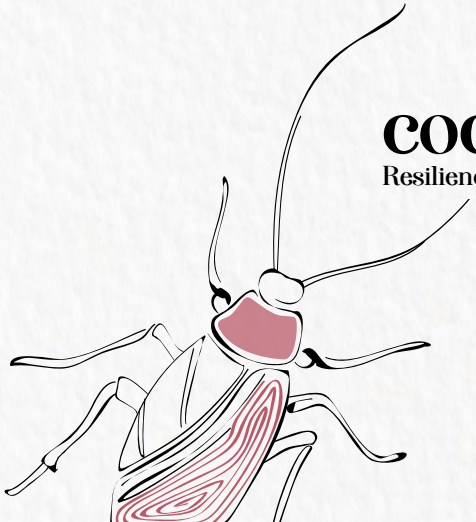
Will Smith's 2006 biographical drama beautifully depicts the story of Chris Gardner- a homeless salesman who struggles to make ends meet. Even in events of extreme adversity, he exudes optimism and continues to hold firm conviction in his beliefs and dreams.

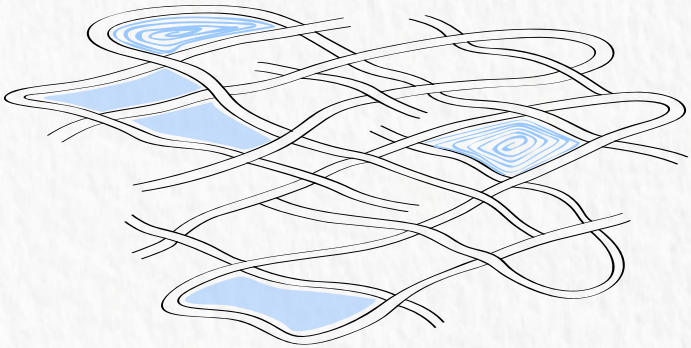
Cockroaches are incredibly adaptive, having adjusted to the changes of the earth and its inhabitants (most recently humans) for hundreds of millions of years. They eat just about anything and thanks to their tendency to live among toxin-producing bacteria, and to eat plant matter that might hold toxic substances, they were "pre-adapted" to the insecticides that humans throw at them.



cockroaches

Resilience in animal kingdom





wolverine fabric

Resilience in materials

Inspired by Wolverine, scientists have developed a self-healing, highly stretchable, transparent material that can be used to power artificial muscles. It is a soft, rubber-like material that's easy to produce at low cost. It can stretch to 50 times its original length, and can heal itself from a scissor cut in the space of 24 hours at room temperature. It could give robots the ability to self-heal after mechanical failure; extend the lifetime of lithium ion batteries used in electronics and electric cars and also improve biosensors used in the medical field and environmental monitoring.

yoga

Resilience in physical, mental & spiritual health

Yoga literally means "union" of the body with mind and spirit via the breath. Our breath is the cord or the connection between our physical body and consciousness. Yogic postures, also called asanas, along with breath control exercises help to control anxiety and develop positivity. Yoga helps untie subconscious knots that prevent us from living to our highest potential. In the words of BKS Iyengar, "Yoga allows you to rediscover a sense of wholeness in your life, where you do not feel like you are constantly trying to fit broken pieces together."

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