

Biomimicry.

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Editorial

Biomimetics or biomimicry is that the emulation of the models, systems, and elements of nature for the aim of solving complex human problems.[1] The terms "biomimetics" and "biomimicry" are derived from Ancient Greek: βίος (bios), life, and μίμησις (mīmēsis), imitation, from μιμεῖσθαι (mīmeisthai), to imitate, from μῖμος (mimos), actor. A closely related field is bionics. Living organisms have evolved well-adapted structures and materials over geologic time through survival. Biomimetics has given rise to new technologies inspired by biological solutions at macro and nanoscales. Humans have checked out nature for answers to problems throughout our existence. Nature has solved engineering problems like self-healing abilities, environmental exposure tolerance and resistance, hydrophobicity, self-assembly, and harnessing solar power.

One of the first samples of biomimicry was the study of birds to enable human flight. Although never successful in creating a "flying machine", Leonardo Leonardo (1452–1519) was a keen observer of the anatomy and flight of birds, and made numerous notes and sketches on his observations also as sketches of "flying machines". The Wright Brothers, who succeeded in flying the primary heavier-than-air aircraft in 1903, allegedly derived inspiration from observations of pigeons on the wing.

Leonardo da Vinci's design for a flying machine with wings based closely upon the structure of bat wings.

During the 1950s the American biophysicist and polymath Otto Schmitt developed the concept of "biomimetics". During his doctoral research he developed the Schmitt trigger by studying the nerves in squid, attempting to engineer a tool that replicated the biological system of nerve propagation. He continued to specialise in devices that mimic natural systems and by 1957 he had perceived a converse to the quality view of biophysics at that point, a view he would come to call biomimetics.

Biomimicry (literally: imitation of the living) aims to require inspiration from survival solutions adopted naturally and

translate the principles to human engineering. The biomimicry approach aims to favor "choices" tested naturally which had many years to know what works best and what doesn't. Designs following biometrics will ultimately allow human productions to be more efficient, resilient and sustainable. During the 1950s the American biophysicist and polymath Otto Schmitt developed the concept of "biomimetics". [5] During his doctoral research he developed the Schmitt trigger by studying the nerves in squid, attempting to engineer a device that replicated the biological system of nerve propagation. [6] He continued to focus on devices that mimic natural systems and by 1957 he had perceived a converse to the standard view of biophysics at that time, a view he would come to call biomimetics.

The central idea is that nature has already fixed many problems society is facing. Animals, plants, and microorganisms are experienced engineers. They know what works, what's appropriate, and most importantly, what lasts on Earth. The main belief of the biomimicry approach is that after 3,8 billion years of research and development, what did not work is now a fossil and what is around us is the secret to survival.

Climbing pads capable of supporting human weight are a mimic of the biomechanics of gecko feet.

The aerodynamics of the famous Japanese Bullet train was inspired by the shape of a bird's beak.

The first flying machine heavier than the air from the Wright brothers, in 1903, was inspired by flying pigeons.

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