

5. Look, Think, and Create!

Nature: The Great Inspiration of Architects

Nature is all around us.

- 1) 그것은 그것의 아름다움으로 우리를 감동시키고 우리가 생존하기 위해 필요한 모든 것을 제공한다.

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It also provides some people with the inspiration to create things in a new way.

- 2) 자연에 기초하여 어떤 것들을 만들어 내는 행위는 '자연모방기술'이라고 불린다.

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This term is derived from the Greek words bios, meaning "life," and mimesis, meaning "imitation."

- 3) 자연모방기술을 활용하는 건축가들은 자연을 그들이 오늘날 직면하는 몇몇 문제에 대한 답을 이미 찾아낸 놀랍도록 성공적인 기술자로 본다.

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They carefully study plants, animals, and other aspects of nature to learn how they work. As a result, they have been able to find some innovative solutions to engineering and architectural challenges.

The Curving Beauty of Nature

The Sagrada Familia is an enormous church in Barcelona, Spain.

- 4) 세계적으로 유명한 건축가 안토니 가우디에 의해 설계된 이 성당은 세계에서 가장 유명한 건축물 중의 하나이다.

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Construction of this remarkable building began in 1882, and Gaudi took over responsibility for its design in 1883. Believe it or not, the building is still under construction. Some people love the Sagrada Familia and others hate it, but nearly everyone is fascinated by its unique design.

Gaudi believed that all architects should look to nature for inspiration.

5) 그는 인공물에서 발견되는 직선보다는 자연물에서 발견되는 곡선을 선호했다.

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This preference can be seen in all his buildings, including the Sagrada Familia. Many parts of the church incorporate images and forms from nature. For example, the church's spires are topped with spheres that resemble fruits.

6) 또한 기둥들의 초석에 새겨진 거북이들과 바다 생물의 껍데기를 닮은 나선형의 계단이 있다.

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Perhaps the most impressive feature of the Sagrada Familia is the ceiling.

7) 가우디는 성당 안의 기둥을 나무와 나뭇가지들을 닮게 디자인하였고, 그래서 위를 올려다보는 관람객들은 마치 그들이 울창한 숲속에 서 있는 것처럼 느낄 수 있다.

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The light that comes through the small holes all over the ceiling even resembles the light beaming through leaves in a forest. These tree-like columns are not just for decoration, though.

8) 나무에서 영감을 받아, 가우디는 기둥들이 꼭대기 부근에서 나뭇가지들로 갈라지는 각각의 토대를 갖도록 했다.

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9) 이것은 지붕의 무게가 균등하게 나누어지도록 해서 기둥이 지붕을 더 잘 지탱할 수 있게 해 준다.

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Because Gaudi recognized the superiority of natural forms, he was able to design a building that is both beautiful and functional.

A Lesson from Insects

The Eastgate Centre is an office building and shopping complex in Harare, Zimbabwe. Built in 1996, it might not be as visually impressive as the Sagrada Familia. However, the building is an

excellent example of biomimicry.

10) 하라레의 뜨거운 기후 때문에 냉방장치를 설치하고 작동하며 유지하는 것은 매우 비용이 많이 들 수 있다.

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To solve this problem, the building's architect, Mick Pearce, turned to termite mounds for an alternative.

Termite mounds are large structures built by certain termite species. Scientists believe that the mounds stay cool due to a constant flow of air.

11) 각각의 개미집은 굴뚝이라고 불리는 구멍들이 망처럼 연결되어 있다.

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It has a large central chimney and smaller outer chimneys that are close to the ground.

12) 흰개미의 일상 활동에 의해 생산되는 열은 중앙 굴뚝을 통해 위로 올라가, 결국 개미집의 꼭대기를 통해 빠져나가게 된다.

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13) 그러는 사이에 더 시원한 공기가 더 작은 굴뚝들을 통해 유입되고, 이는 흰개미들의 집을 뜨거운 낮 동안 쾌적한 온도로 유지시켜준다.

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Also, the soil surrounding the mound absorbs heat in the hot daytime hours.

14) 그래서 흰개미집 안쪽의 온도는 크게 올라가지 않고 비교적 시원하게 유지된다.

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At night, when the outside temperature goes down, the heat is finally released. This process inspired Pearce to design an innovative climate control system.

The Eastgate Centre was constructed without a conventional cooling system. Instead, Pearce used building materials that can store large amounts of heat. The floors and walls of the building

absorb heat during the day, just like the soil of a termite mound.

15) 그 열이 밤에 방출되면 벽은 차가워지고 다음날 아침쯤에는 다시 열을 저장할 준비가 된다.

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The structure of the building also helps keep the building cool. There are openings near the base of the building, and outside air comes into the building through them. This air is moved through the building by a system of automatic fans.

16) 결국, 이 공기는 낮 동안 사람들의 활동으로 인해 생기는 열기와 함께 건물 내부의 열린 공간을 통해 위로 올라가서 지붕에 있는 굴뚝을 통해 빠져나가게 된다.

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As a result, the building has not only cool temperatures but also fresh air.

17) 더욱 중요한 것은, Eastgate Centre가 다른 건물보다 훨씬 적은 에너지를 사용한다는 것인데, 이는 돈을 절약하고 오염으로부터 환경을 보호하는 데 도움을 준다.

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18) Pearce가 작은 흰개미로부터 받은 영감이 없었더라면, 이 중 어떤 것도 가능하지 않았을 것이다.

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19) 건축에서 자연모방기술을 사용하는 것은 인간이 어떤 것을 하는 방식을 향상시키기 위해 자연의 교훈을 이용하는 한 방식일 뿐이다.

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Biomimicry is also being used to solve problems in the fields of robotics, agriculture, and many others. Imitating the ideas of nature not only helps solve problems, but it also makes us feel closer to nature.

20) 결과적으로, 인간은 환경을 파괴하는 것을 멈추고 대신에 그것의 일부가 되기 시작할 가능성이 커진다.

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◇「콘텐츠산업 진흥법 시행령」제33조에 의한 표시

1) 제작연월일 : 2019년 04월 20일

2) 제작자 : 교육지대㈜

3) 이 콘텐츠는 「콘텐츠산업 진흥법」에 따라 최초 제작일부터 5년간 보호됩니다.

◇「콘텐츠산업 진흥법」외에도「저작권법」에 의하여 보호되는 콘텐츠의 경우, 그 콘텐츠의 전부 또는 일부를 무단으로 복제하거나 전송하는 것은 콘텐츠산업 진흥법 외에도 저작권법에 의한 법적 책임을 질 수 있습니다.

정답

- 1) [정답] It impresses us with its beauty and supplies us with everything we need to survive.
- 2) [정답] The act of creating things based on nature is called "biomimicry."
- 3) [정답] Architects who use biomimicry look at nature as an incredibly successful engineer who has already come up with answers to some of the problems they now face.
- 4) [정답] Designed by the world-famous architect Antoni Gaudi, the church is one of the most prominent buildings in the world.
- 5) [정답] He preferred the curves found in natural objects to the straight lines found in artificial ones.
- 6) [정답] There are also turtles carved into the stone bases of columns and spiral stairs that resemble the shells of sea creatures.
- 7) [정답] Gaudi designed the columns inside the church to resemble trees and branches, so visitors who look up can feel as if they were standing in a great forest.
- 8) [정답] Inspired by trees, Gaudi gave the columns a single base that splits off into branches near the top.
- 9) [정답] This allows them to support the roof better by distributing its weight evenly.
- 10) [정답] Due to the hot climate of Harare, air conditioning systems can be very costly to install, run, and maintain.
- 11) [정답] Each mound has a network of holes referred to as chimneys.

- 12) [정답] The heat generated by the daily activity of the termites rises up through the central chimney, eventually escaping through the top of the mound.
- 13) [정답] In the meantime, cooler air is pulled in through the smaller chimneys, keeping the termites' home at a comfortable temperature during the hot day.
- 14) [정답] Therefore, the temperature inside the mound does not increase greatly and stays relatively cool.
- 15) [정답] The heat is released at night, and the walls cool down, ready to store heat again by the next morning.
- 16) [정답] Eventually, the air, along with heat generated by human activity during the day, rises upward through the building's internal open spaces and is released through chimneys on the roof.
- 17) [정답] More importantly, the Eastgate Centre uses far less energy than other buildings, which saves money and helps protect the environment from pollution.
- 18) [정답] Without the inspiration Pearce received from tiny termites, none of this would have been possible.
- 19) [정답] Using biomimicry in architecture is just one way that humans are utilizing the lessons of nature to improve the way we do things.
- 20) [정답] As a result, humans are more likely to stop destroying the environment and start becoming part of it instead.