

HOW THE
**SEVEN
WONDERS**
OF THE ANCIENT WORLD
WERE BUILT

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Albatros





Introduction

They shine from the past . . . and their light is not diminishing. The gems of antiquity are proof that humans can compete with the wonders of nature. People have always wanted more: to improve existing methods and find new opportunities. They want to create something new, something that evokes a feeling of amazement and admiration. A masterpiece that will make their creators famous during their lives and immortal thereafter.

From the inconspicuous to gigantic

All masterpieces begin with a first small step. An idea. A plan. A drawing. Before building a pyramid, a giant statue, or a hanging garden, it takes millions of small steps, small strenuous activities, daily work, and blood, sweat, and tears to realize the vision that the author wanted to give dimension, color, and shape to. Fascinating, isn't it?

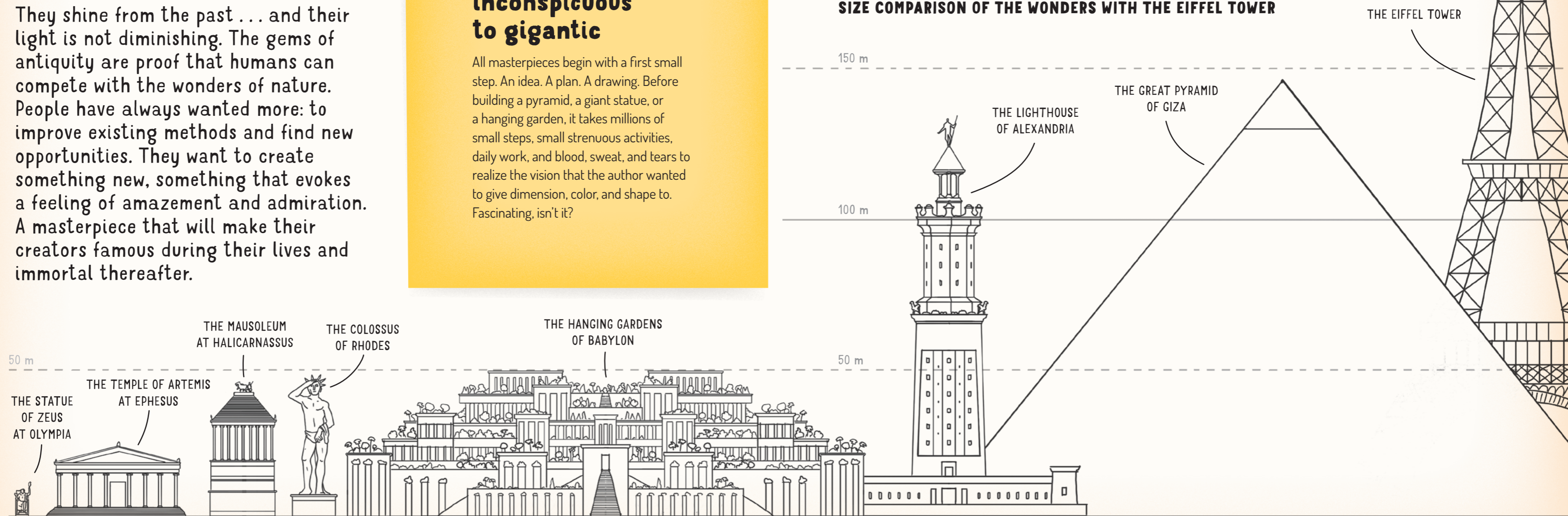
The Seven Wonders of the World

The list of the Wonders of the World has evolved over the years. After all, their nascency covers a long historical period from the third millennium BC, when the oldest and only preserved Egyptian pyramids were built, to the first millennium BC, when other buildings saw the light of day. The travelers and writers of the world were certainly not lazy. They wandered long distances across countries, most often by sea, to find and report to everyone about the breathtaking colossus, the lighthouse, the gardens, and many more. And where else should the list come from than the cultural center of Egypt—Alexandria. And why seven? Well, there are seven days in the week, seven sacraments, and seven virtues. In the Middle Ages, there were even seven liberal arts. The number seven denotes completeness and mysticism—what do you think?

Myth or reality?

Nowadays we can do a lot of things, like talk to people from the other side of the world, sink to the bottom of the ocean, or launch into space. But we still can't go back in time. Fortunately, there are historians and archeologists who want to know what it looked like in the past and how people without modern technology could build such colossal structures. Their opinions differ and we do not know for sure how it all was. But we can believe them and delve into the sometimes unbelievable stories of "How the Seven Wonders of the Ancient World Were Built."

SIZE COMPARISON OF THE WONDERS WITH THE EIFFEL TOWER



The Pyramids of Giza

This is the only wonder that has survived thousands of years of sun, wind, and the ravages of time. The Pyramids of Egypt were built during the Fourth Dynasty in the third millennium BC. They consist of the Great Pyramid of Giza (also known as the Pyramid of Khufu or of Cheops), the Pyramid of Khafre, and the Pyramid of Menkaure. Many questions regarding their construction have not been and probably will never be answered. That's why this text is interspersed with words like *probably*, *possibly*, or *likely*. Let's dive into the mystery!

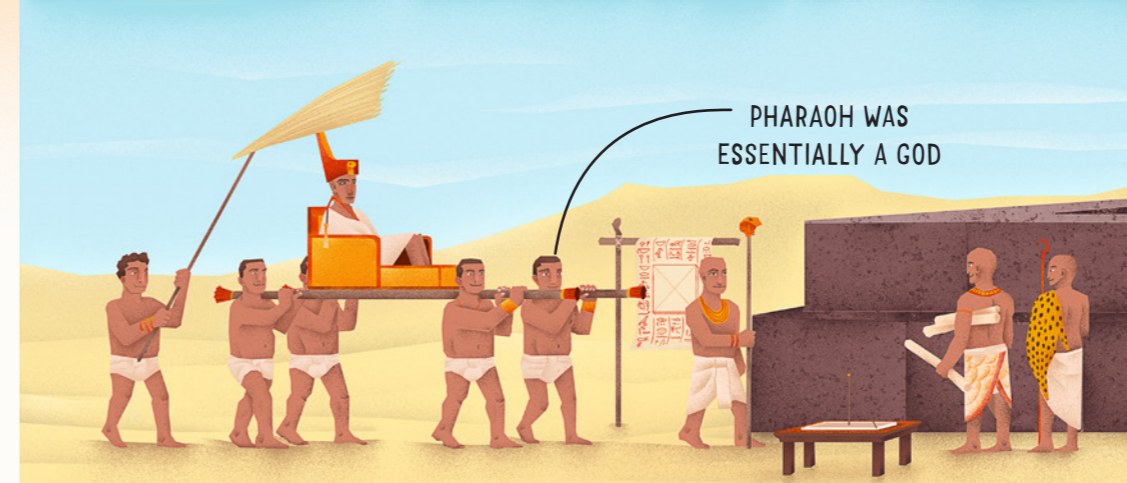


Land on the Nile

Pharaoh Khufu chose the plateau of Giza to be his resting place, as it provided sufficiently strong bedrock for the construction of such a grand monument. The location was also advantageous because of the nearby Nile, a great traffic artery. The river was used to transport limestone from the town of Tora and granite from the Aswan quarries, which were located more than 500 miles to the south. Can you hear the waves breaking against the ships?

The greatest of them all

The Great Pyramid of Giza, also known as the Pyramid of Khufu, is the largest, most beautiful, and best preserved of the three pyramids. Its walls face the four cardinal points—north, south, east, and west—and each has a base of more than 750 feet. It weighs about 5 million tons, standing at 450 feet. It was originally at least 30 feet higher, but it lost its decorative top over the centuries. At the time of construction, it was covered with limestone cladding because each pyramid of Ancient Egypt was supposed to shine and sparkle in the sun; today, the cladding can only be found at the top.

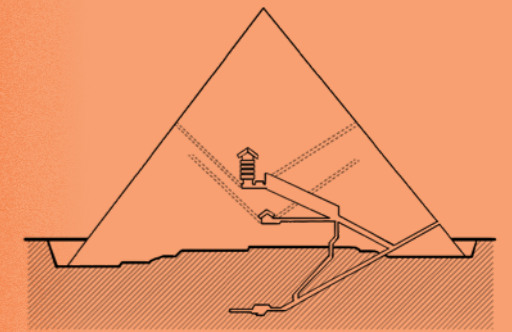


The Pharaoh's architect

"Here, your majesty, will stand a pyramid rising into the sky. A perfect square, look, your royal highness!" the architect welcomed his cousin, Pharaoh Khufu. He visited the site several times to check on the progress of his resting place. In addition to the pyramid, the tomb complex included a valley temple, a causeway, and a mortuary temple. All the parts were designed and planned together, but the pyramid was the top priority. It was measured and constructed first. The architect couldn't afford to make any mistakes!

Khufu's crafty family

We don't know much about Pharaoh Khufu, but preserved papyri depict him as a cruel and despotic ruler. He was the son of King Sneferu and Queen Hetepheres I. He had enormous power, enforced absolutism, and owned all the land in the kingdom and every subject in it. The title of the greatest pharaoh of Ancient Egypt is also based on his architectural achievements, including the Great Pyramid and the surrounding temple complex. He was the only one who managed to build such a monumental pyramid, although many others tried, including his son Khafre and grandson Menkaure.

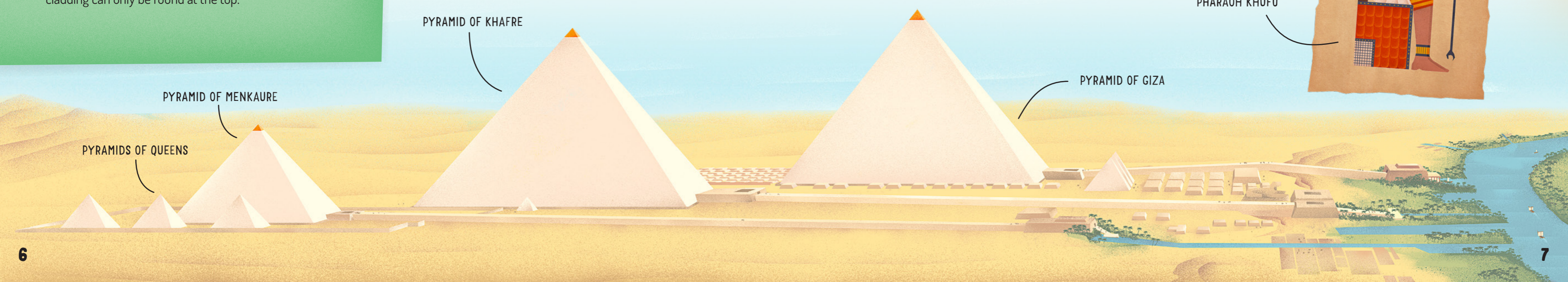


Pyramid cross-section

The entrance of the pyramid was accessed by a down-sloping passage that led to the oldest burial chamber. Later, the passages leading from the original entrance went upwards. At a height of over a hundred feet above the bedrock, there is a middle space designated as the Queen's Chamber. The largest space in each pyramid was the internal gallery. This one is 150 feet long and 27 feet high and leads to the highest King's Chamber, which served as the resting place of Pharaoh Khufu. The third chamber is located halfway up the pyramid.



PHARAOH KHUFU



On the site

The Pyramid of Khufu was probably built around 2550 BC and has been guarding a great secret for several millennia. How could they build such a massive monument when they didn't have pulleys, iron, or other more complex tools?

Ramps

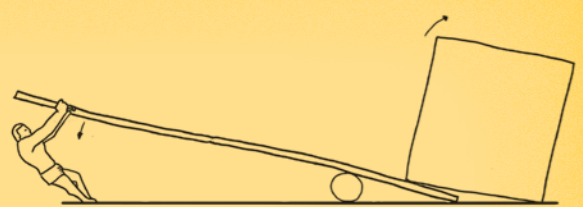
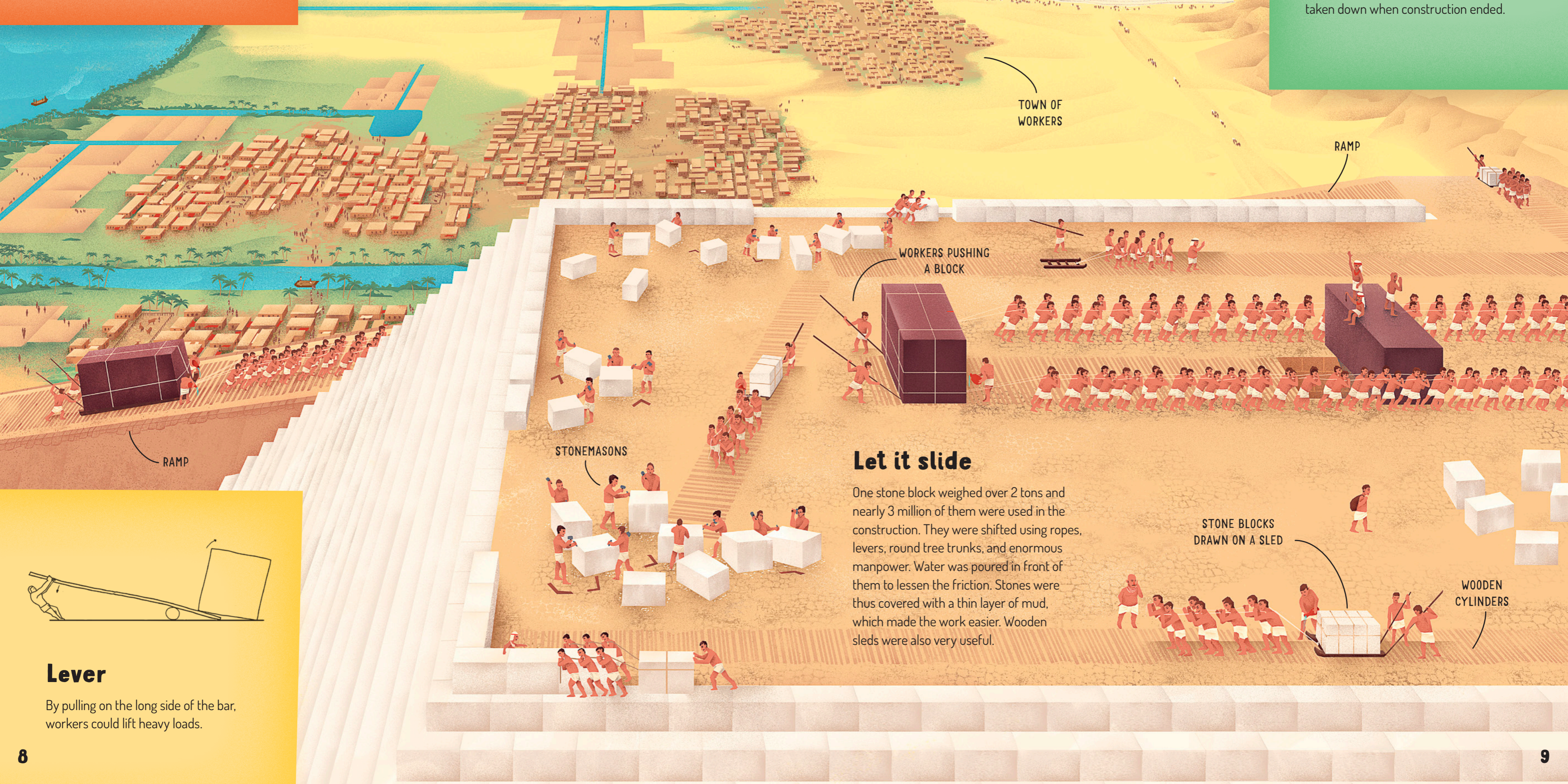
The pyramid grew thanks to work ramps. One led from the pier and canal, where construction materials and supplies for workers were transported on ships. The second one most likely went from a quarry near the pyramid, from which a number of the stone blocks were imported. To a certain height, two straight ramps with a slight slope were used; in higher positions, there was a spiral inner ramp around the structure. Unfortunately, the Great Pyramid itself doesn't provide any evidence and we only have the speculations of historians.

A town of workers

Over 20 years, the construction of pyramids employed around 20,000 skilled artisans and free peasants—not slaves, as historians once thought. Stonemasons had a privileged position. A workers town made of unfired bricks was found near the structures. It included bakeries, fish shops, water mills, and windmills. Hardworking artisans were well provided for.

Material

The Great Pyramid of Giza was built on bedrock to ensure a solid foundation for this magnificent structure. The core of the pyramid consists of hard and resistant granite, and the surface was originally covered with Tora limestone, which made the pyramid shine. The limestone casing was attached to granite blocks to ensure stability, and it was hewn and polished and the ramps were taken down when construction ended.



Lever

By pulling on the long side of the bar, workers could lift heavy loads.

Let it slide

One stone block weighed over 2 tons and nearly 3 million of them were used in the construction. They were shifted using ropes, levers, round tree trunks, and enormous manpower. Water was poured in front of them to lessen the friction. Stones were thus covered with a thin layer of mud, which made the work easier. Wooden sleds were also very useful.

STONE BLOCKS DRAWN ON A SLED

WOODEN CYLINDERS

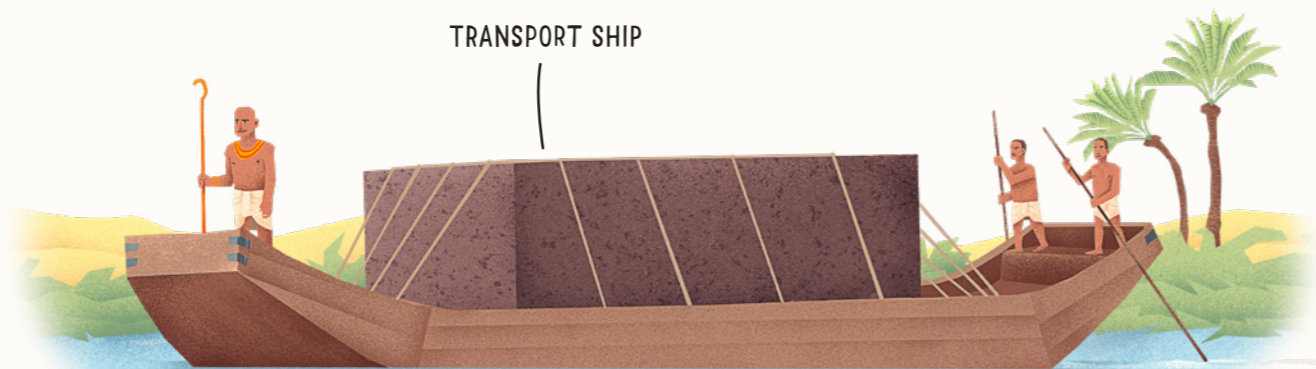
Predecessors of the pyramids

Afterlife palaces were first carved into rocks. They were later extended by a superstructure of fired bricks, and occasionally of stone, which was called mastaba. It was the direct predecessor of pyramids and was used to store funerary offerings for the deceased; wealthy people even had several rooms in there. Imhotep, a philosopher, physician, poet, and court architect of Pharaoh Djoser, came up with the idea to pile up several mastabas, thus creating the pyramid in Saqqara, the first of its kind. Pyramids became very popular at that time, and each ruler wanted to have one.



Afloat

Preparing stone blocks in the quarry was a strenuous task. That's why the work was only entrusted to the most skilled stonemasons and craftsmen. Once the granite and limestone blocks were ready, they had to be transported as close to the pyramid as possible. The best method was to transport them by water, as the workers could use the Nile and the dense network of canals leading to each pyramid, if the subsoil allowed it. The transport by special ships is also documented by discovered papyri.



A master stonemason's work

Hard granite blocks were made by disturbing the rock surface using fire and water in turns. They then made gouges with copper chisels, drove hardwood wedges into them, and poured water on the wedges. Expanding wood either broke the stone itself or made it possible to break it using crowbars. Broken-off granite blocks were attached to a platform and further worked with a copper saw pulled by several men on each side. They used a kind of sand called silica sand as the abrasive material.



It holds together!

The blocks didn't always have a perfect shape. Well, even experts make mistakes sometimes. We know that granite blocks in the core were crafted poorly and roughly, and the gaps between them were filled with plaster mortar. Mortar was also used to attach the limestone cladding. Final adjustments and hewing away excess cladding required wooden scaffolding. Occupational safety had to be observed even in Ancient Egypt.

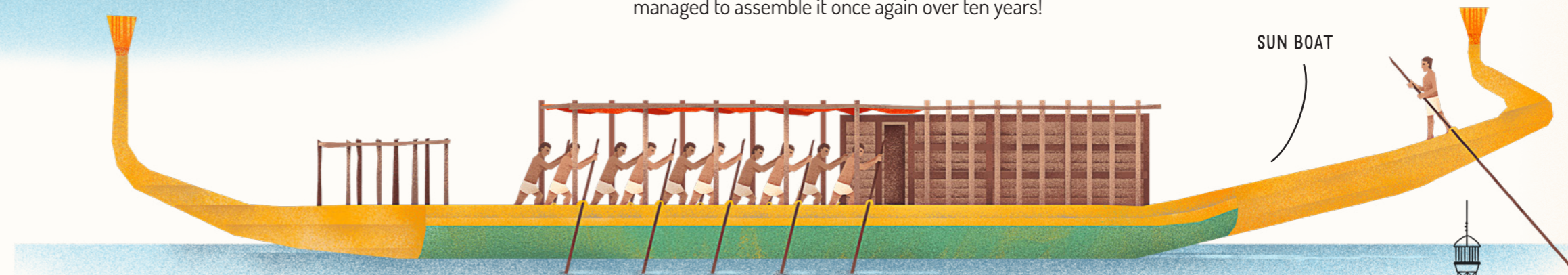
The afterlife

In Ancient Egypt, rulers and important members of their families were buried in tombs. Sumptuous dwellings and true afterlife palaces were built for the deceased so that they had space for their soul. As they saw it back then, the soul could only survive if the remains were present in this world. That was ensured by the mummification process, which started immediately after death and could last more than 70 days. At the very end, the corpse was wrapped in a cloth along with various amulets and magic formulas.



Sun boats

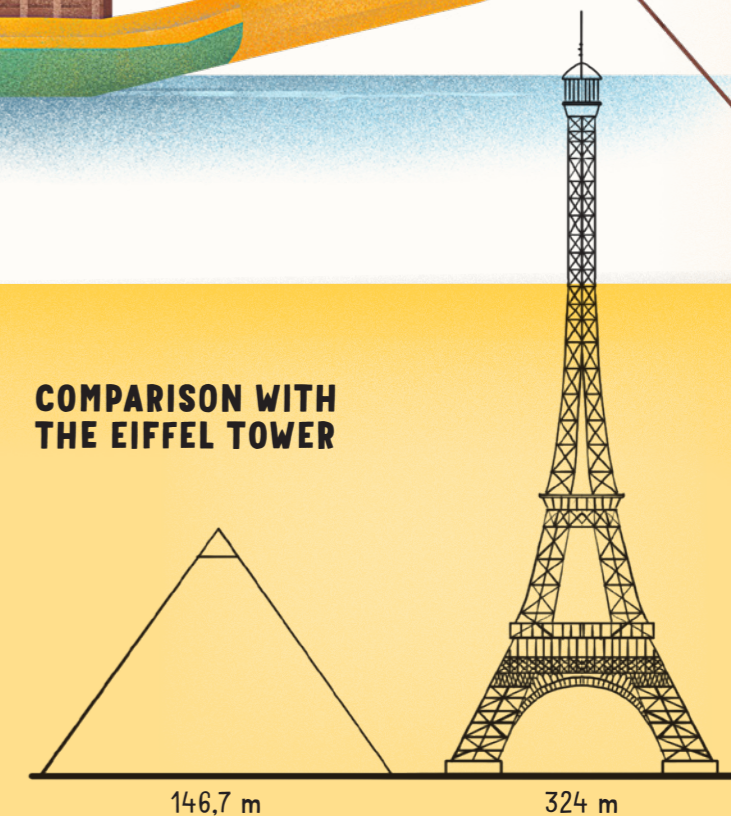
When all the steps of the mummification process were completed, the corpse could be buried in the tomb. The ruler's embalmed body was transported on the Nile by a special ship called a sun boat directly to the mortuary temple, where glorious ceremonies and celebrations could begin. In the mid-twentieth century, Egyptian archeologists made a rare discovery. In the Great Pyramid, they found Khufu's sun boat dismantled into individual parts, and they managed to assemble it once again over ten years!



Khufu's legacy

The mysteries and size of the Pyramids of Giza strike people speechless with wonder. The Great Pyramid of Giza has been admired by visitors to Egypt for more than 4,500 years. Despite numerous rumors, assumptions, theories, and hypotheses, we still cannot say exactly how the pyramids were built. And who knows if this mystery will ever be cracked.

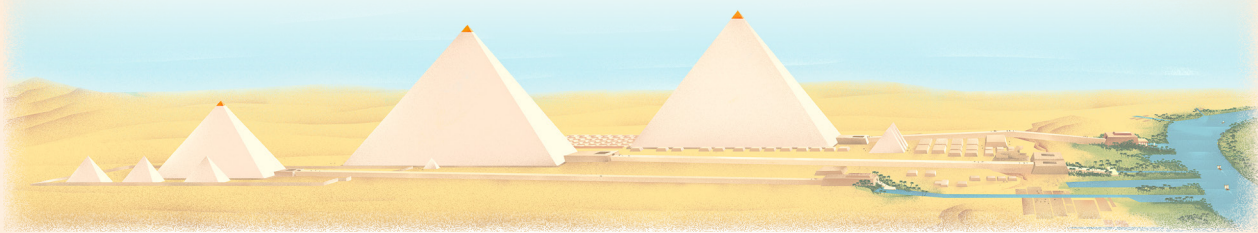
COMPARISON WITH THE EIFFEL TOWER



146,7 m

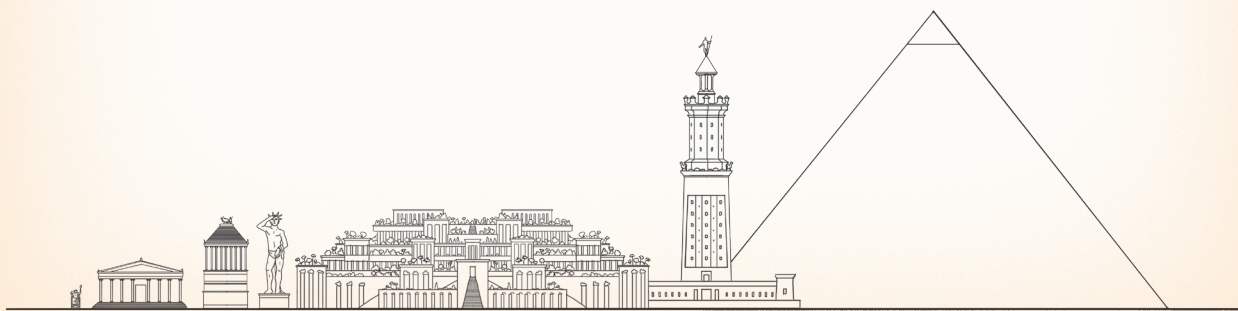
324 m

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Illustrated by Tomáš Svoboda
Written by Ludmila Hénková

Each one was unique, its beauty and magnificence lauded by the greatest poets and writers of the age. Everyone longed to see for themselves the Wonders of the World: the Colossus of Rhodes, the majestic Great Pyramids of Giza, the Lighthouse of Alexandria, which withstood earthquakes and gales, the spellbinding Statue of Zeus at Olympia, the breathtaking Temple of Artemis in Ephesus, the Mausoleum at Halicarnassus, and the Hanging Gardens of Babylon, inspiration for so many myths and legends. Just one of them survives today. But come with us as we go back in time and learn the secrets of how these gems of ancient architecture were created. The building of each architectural masterpiece comprised so many details and small jobs, so much daily grind and sustained effort, with or without the help of machines.



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