LARGER THAN LIFE

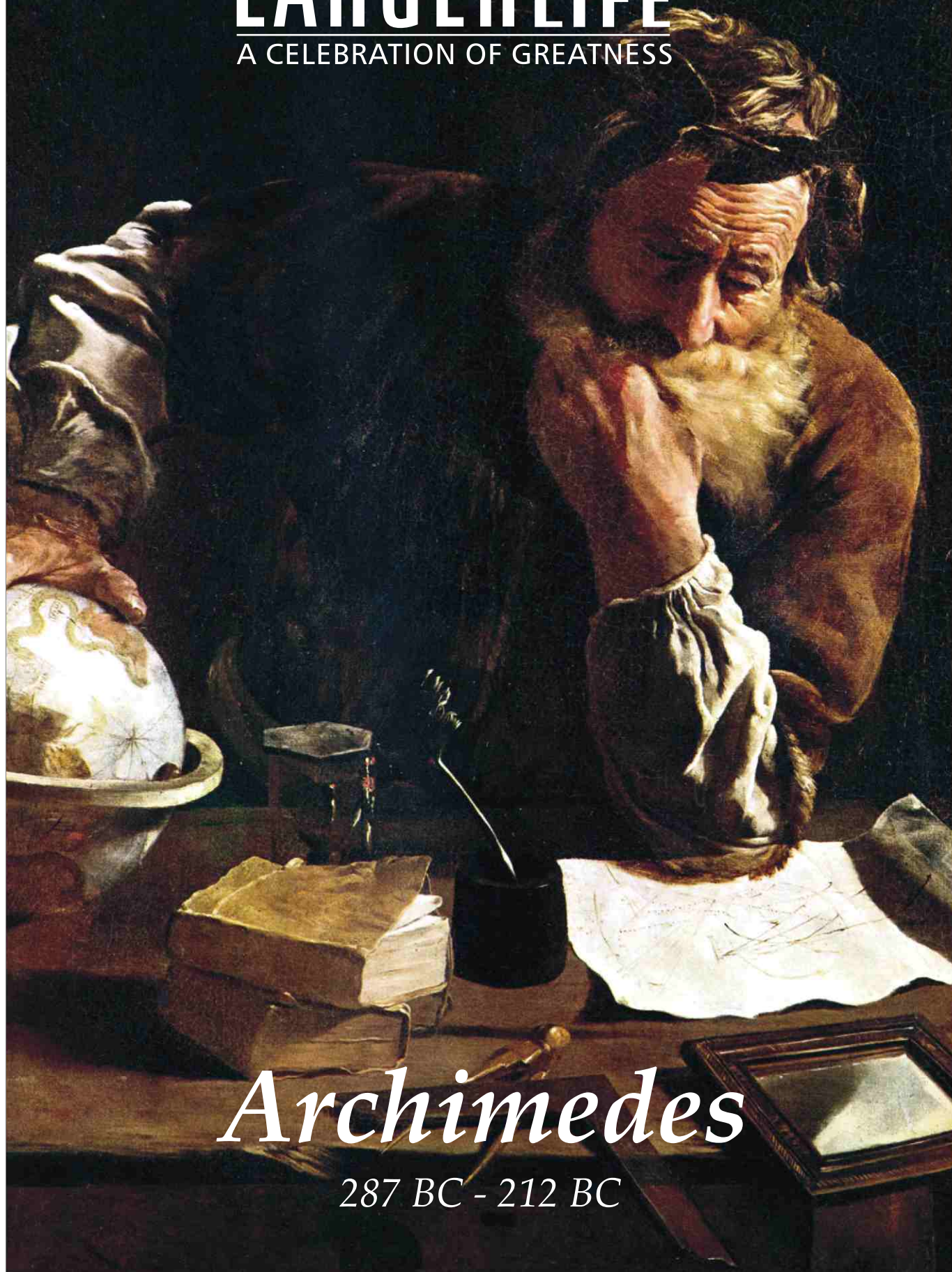## A CELEBRATION OF GREATNESS

Archimedes

287 BC - 212 BC

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INTRODUCTION

Archimedes of Syracuse was an ancient **Greek mathematician, physicist and engineer.** Although little is known about his life, he is regarded as one of **the leading scientists in classical antiquity.** In addition to making discoveries in the fields of mathematics and geometry, he is **credited with producing machines that were well ahead of their time.** He laid the foundations of hydrostatics, and explained the principle of the lever, the device on which mechanics is based. Archimedes was **also an accomplished engineer and an inventor.**

BIRTH AND EARLY LIFE

Archimedes was **born in Syracuse, Greece in 287 BC.** He was the son of an astronomer: Phidias of whom nothing is known. Archimedes received his formal education **in Alexandria, Egypt,** which at the time was considered to be the **'intellectual center' of the world.** When he completed his formal studies in Alexandria, he returned and stayed in Syracuse for the rest of his life. It is not known whether he ever married or had children.

INVENTIONS

Defined pi between 3 + 10/71 and 3 + 1/7: Archimedes was not satisfied with the definition of pi as 3 + 1/7 0r 22/7. This was one of his most important accomplishments. This **showed that pi was not equal to 3 + 1/7.** He did this by circumscribing a regular 96-sided figure (bisecting the sides of a hexagon 4x) inside a circle, and circumscribing a circle inside a 96-sided figure. Archimedes would increase the accuracy of pi by increasing the number of the sides on the figure. Archimedes increased the number of sides until he couldn't get more precise.

Law of Hydrostatics (buoyancy), also known as the Archimedes Principle: The most famous story of Archimedes life involves the discovery of Archimedes' Principle. **The story begins when King Hieron asking a goldsmith to construct a gold wreath to the immortal gods.** After some time, the king came to **suspect** that the wreath was **not pure gold** but rather filled with silver. In order to end his suspicion, the king **asked Archimedes to determine whether the wreath was pure gold or filled with gold without destroying it.** Archimedes agreed to try to solve the king's problem. Then one day, while he was taking a bath,

Archimedes noticed that the water level rose in the bath as he entered the water. Archimedes was so excited by this discovery that he jumped out of his bath and ran naked through the streets yelling, **"Eureka, Eureka!!" meaning, I have found it.** Archimedes had discovered that a body immersed in a fluid displaces its weight of fluid. This principle in turn helped Archimedes prove that the gold wreath was not solid gold.

The Archimedes screw: This machine was built for **raising water to highland areas in Egypt that could not receive water directly from the Nile River.** This device is still used today for irrigation purposes even is some countries today.

Creation of the lever and pulley system: He **proved his theory of the lever and pulley to the king by moving a ship, of the royal fleet, back into the ocean.** Then, Archimedes moved the ship into the sea with only a few movements of his hand, which caused a lever and pulley device to move the ship.

Areas and volumes of spheres, cylinders and plain shapes: He showed that the volume of a sphere is two-thirds of the **volume of the smallest cylinder that can contain the sphere.** He also found a formula to find the area under a curve, the amount of space that is enclosed by a curve.

Powers of Ten: It was a **way of counting that refers to the number of 0's in a number,** which eliminated the use of the Greek alphabet in the counting system.

The Catapult: He invented catapults, which **hurled blocks of stone, and cranes, which dropped large stones on approaching ships.**

The Burning Mirrors: He invented the burning mirrors, which were a kind of weapon. They were **used to reflect sunlight on the adversarial ships to burn them.**

Scaling Ladders: He developed scaling ladders, which **helped soldiers climb over enemy walls.**

DEATH

A Roman soldier when the **Romans invaded Sicily unfortunately killed him in 212, B.C.** in the Second Punic War. He was doing a mathematical problem when a Roman soldier confronted him. He refused to move until his problem was finished so the soldier ran a sword through him. The **last words attributed to Archimedes are "Do not disturb my circles",** a reference to the circles in the mathematical drawing that he was supposedly studying when disturbed by the Roman soldier.

General Marcellus was reportedly angered by the death of Archimedes, as he had ordered him not to be harmed. **In Archimedes' tomb he requested (before he died) that a sphere containing a cylinder, with the ratio of the two, be inscribed upon it.**

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Quotes By Archimedes

(Archimedes is said to have remarked about the lever)

"Give me a place to stand on,
and I will move the Earth."

Quotes About Archimedes

"Too often we forget that genius, too, depends upon
the data within its reach, that even Archimedes
could not have devised Edison's inventions"
- Ernest Dimnet

"The good opinion of mankind, like the lever of
Archimedes, with the given fulcrum, moves the world."
-Thomas Jefferson