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# The Science and Art of Water

Italian Renaissance polymath Leonardo da Vinci was a passionate student of the water

By ELAINE K. HOWLEY

In a world critically dependent on water, the delicate balance between too much and too little has increasingly become an important topic for city planners, water resource managers, and a variety of other professionals dedicated to ensuring there's enough water to go around but not so much as to drown the vulnerable.

It may seem like a newfangled idea to try to manage water and hold back the floods, but there's a lengthy history of water infrastructure and humans' efforts to manage the way water shapes our world, and one of the earliest champions of managing our risk around water was Leonardo da Vinci, the renowned polymath whose supremely beguiling "Mona Lisa" remains the most recognizable work of art on Earth.

Leonardo was so invested in learning the ways of water in the 15th and 16th centuries that Florentine government records dubbed him "Master of Water." He thought deeply about water and its power and sought to invent means of using water to advance human pursuits.

Describing water as "the vehicle of nature" (or vetturale di natura in his native Italian), he believed "water to be to the world what blood is to our bodies," writes art history professor Chris Witcombe at Sweet Briar College in Virginia.

But Leonardo also respected and feared the awesome power of water and created many studies and drawings of swirling water, documenting its physical properties. He witnessed the Arno River flooding that devastated the countryside in 1466 and 1478, and Witcombe writes, "perhaps as a result of these events, and as a way of dealing with his fears, Leonardo devoted a lot of energy to developing ways or devices to control and move around water."



He also investigated ways of aiding swimming and supporting water safety for people who lived near or on the water. One of these designs resulted in an apocalyptic-looking scuba suit with a mask that feels like it stepped right out of a sarin gas attack or like an octopus-human chimera in some futuristic, aquatic dystopia.

Nevertheless, the design was ingenious in allowing a person to breathe underwater. According to a 2016 article by Cara Giaimo in *Atlas Obscura*, there's no evidence that Leonardo ever built the scuba suit design himself, but he "considered the suit so powerful that he refused to divulge its details, fearing the technology would be abused by the 'evil nature of men.'"

Leonardo clearly saw the potential military applications of the diving suit and may have been tinkering with the design as a means of besting the Ottoman navy, which was at war with the Republic of Venice when he designed the suit. (Though he was a Florence native, he'd been living in Milan for nearly two decades when French soldiers invaded. He fled to Venice for a few months, a place that no doubt fostered his watery interests.)

International Swimming Hall of Fame historian Bruce Wigo wrote in a 2022 article published in *Swimming World* magazine that Leonardo marveled at how fish and other aquatic creatures move through water, and wondered why most Europeans did not: "How it is that animals which have not long hind quarters cannot swim. How it is that all other animals which have feet with toes know by nature how to swim, excepting man. In what way man ought to learn to swim. Of the way in which man may rest on the water ... How he ought to move his arms. How to swim on his back. How he can and how he cannot stay underwater unless he can hold his breath."

Though he was in favor of people learning to swim, Leonardo understood the practicalities and potential for drowning, so he dreamed up a leather water belt that, when filled with air, would support a swimmer around the waist and prevent submersion; it looks an awful lot like the life ring you might find at any hotel pool today—yet another example of how the brilliant thinker was usually ahead of his time in all things science, art, and swimming.

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Elaine K. Howley is an award-winning freelance writer and editor specializing in sports, health, and history topics. Her work has appeared in numerous print and online publications including [AARP.org](#), *Atlas Obscura*, *espnW*, and *U.S. News & World Report*. A lifelong swimmer who specializes in cold water marathon swimming, she has contributed to *SWIMMER* magazine since 2009 and [USMS.org](#) since 2012. Contact her via her website: [elainekhowley.com](#)

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