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IN THEIR OWN WORDS

Leonardo da Vinci's
Codex Leicester

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By Big History Project, adapted by Newsela

Leonardo da Vinci (1452 — 1519) was a multi-talented Italian scholar who gave meaning to the term “Renaissance man.” He was a painter, architect, mathematician, inventor, engineer, and more. The Codex Leicester is a 72-page scientific journal handwritten by da Vinci. The Codex is named for the Earl of Leicester, Thomas Coke, who bought it in 1717. In the Codex, da Vinci notes his observations about astronomy, the movement of water, light, fossils, and geology. The creative thinking process of a scientist is on display. We can see how da Vinci argues, probes, and gathers information on which to base claims.

Here are selections of Codex. They have been translated and adapted to provide a simplified look at da Vinci's experiments and observations.

Note: Headings have been inserted by the editors.

1 Observing light and waves

“The Moon is without any light of its own. It has only the light which it takes from the Sun. But it could not take nor reflect that light if its surface was not dense and shining like either a mirror or liquid. But, if it were like a shining mirror, it would give us only some of the light. It would reflect at an angle that would make very little light. But maybe the Moon contains oceans. If its glow comes from a liquid body, the reflected rays would not lose their character. Nor would they lose their great brightness. But if it is wavy, as we see in the oceans, then the brightness will convey itself to each single wave on its own account. Then all together will cause a great quantity of brightness. However, the shady parts of the waves mean the brightness will not be as powerful as it was originally.” (Codex Leicester, Folio 1 R)

Shells in the mountains

“Shells can be seen today in Italy, far from the seas, at great heights in the mountains. You say they were brought by the Great Flood described in the Bible, which was higher than the highest mountain. My reply is that these shells, which always reside near sea shores, ought to have remained on those mountains. They should not be found so low as the feet of the mountains, every one at the same height, layer by layer.

You might then say that these shells are inclined to stay near the sea shores. And you say, as the water rises at such a height, the shells follow the rising water up to their greatest height. I would reply that a sea snail is no faster than the land snail when it is out of the water. In fact it will be even slower. The snail does not swim. Rather it makes a trail in the sand and will walk less than 2.5 meters (8 feet) a day. At this rate, the shell could not walk from the Adriatic Sea to the Monferrato in Northern Italy in 40 days, as the Bible said. The snails could not have walked that distance of 400 kilometers (249 miles).

And you might say that the waves carried the shells there. I would reply that because of their weight they cannot be supported except on the sea bed. Things that are heavier than water do not float on water. You may not accept this. But, at least acknowledge that they had to remain on the tops of the highest mountains, and in the lakes that are enclosed among the mountains. (Codex Leicester, Folio 8 V)

46 Underground water and a moving Earth

“The heat of the fire burning within the center of the Earth warms the waters which are enclosed within the great caverns. This heat causes
50 the waters to be warmed and evaporated. They raise themselves up to the roofs of the caverns, and climb through cracks in the mountains. They climb higher still, until it finds the cold, and suddenly changes back into water. It falls down and forms the beginning of the rivers. But when great coldness pushes back the heat toward the center of the
55 world, this heat becomes more powerful. It gives rise to greater evaporation of the waters. These evaporations heat the caverns in which they circulate.

Yet they cannot produce the waters as they used to. Just as it is seen
65 in the making of alcohol, if the evaporation of wine did not pass through cool water, it would never change into alcohol. It would instead return to vapor and finally it would condense to such an extent that it would break through whatever holds it.

70 We will say the same of water heated in the depths of the earth. If the water cannot find the coolness it needs, it does not form itself into water as it did before. Instead it condenses and congeals like the fire multiplied and condensed within a bomb. It makes itself harder and more powerful than the matter that receives it.

75 And so, unless it has a sudden release, it immediately proceeds to break and destroy whatever holds it. The evaporation of water bursts within the depths of the Earth in different places, revolving and rumbling with great commotion. Finally, it reaches the surface of the earth
80 as an earthquake. The power ruins mountains and collapses cities. It emerges with great wind through the breaks previously made in the Earth; and so, by this exhalation, it consumes its own power.” (Codex Leicester, Folio 28 R)

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