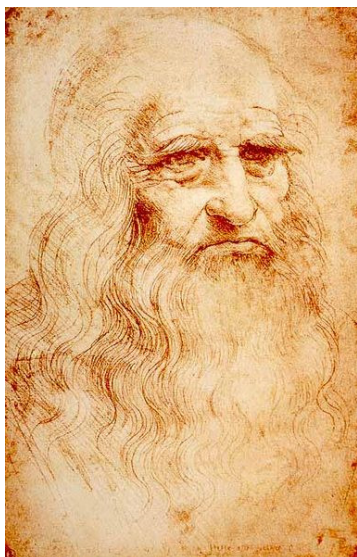


<< [The assassination of Archimedes](#) | [Tale of a shipwrecked pocketwatch](#) >>



Leonardo's time travel

29. settembre 2010 20:37



When describing Leonardo da Vinci's scientific achievements, it's hard to avoid using the phrase "ahead of his time". His careful observations and logical analysis in fields from astronomy to physiology seem a world apart from anything his contemporaries were doing, and it took centuries for mainstream science to catch up with his insights. It's as if someone took a modern scientist and teleported them into the Renaissance.

But it turns out that the driving force for many of da Vinci's studies was very distant from anything that today's researchers would recognise; in fact it was decidedly mystical. So can we still call him a scientist?

I've just written [a feature for New Scientist](#) about the discovery that da Vinci made spectacular advances in a previously unnoticed area - the study of trace fossils, or ichnology. Da Vinci studied fossilised sea creatures found in the mountaintops near Milan, where he worked for many years, and his progress in interpreting their origin is well known. He realised that the ground there once formed the bed of an ancient sea, and that the fossils were the remains of animals preserved when the sediment they lived in turned to rock.

This was at a time when everyone else was hotly debating whether the creatures had been carried into the mountains during the great flood described in the Bible, or were inorganic structures that had spontaneously grown within the stone.

Now a new analysis of one of da Vinci's secret notebooks shows that as well as studying body fossils (the direct remains of an organism), the scholar was interested in trace fossils - the marks and trails left behind by ancient creatures. These abstract traces are tough to interpret, in fact their origin was not accepted by mainstream science until the early 20th century. But da Vinci had it all worked out 400 years earlier.

The notebook shows that da Vinci knew certain trace fossils were the remains of creatures crawling between layers of sediment before they turned to rock, and that this interpretation was crucial for his arguments against the Biblical and Inorganic theories of fossil formation. Palaeontologist [Andrea Baucon](#), who made the discovery, hails da Vinci as the "father of ichnology".

You can read more about all this, including possible representations of trace fossils in da Vinci's art, in [my feature](#). But one question I was fascinated by when digging into all this was: why was da Vinci so obsessed by fossils? What made him study them in such detail when no one else was paying much attention?

It turns out that the answer is in a brilliant essay by the late [Stephen Jay Gould](#) in his 1998 book "[Leonardo's mountain of clams and the diet of worms](#)", which by a lovely coincidence was sitting on the bookshelf right next to me when I sat down to write my article. (I've been a fan of Gould ever since I read [Wonderful Life](#) at school, in fact he was a big influence on my decision to study biology at university. By another coincidence Gould was the guest speaker when I later graduated from Leicester University in 1995. Except that the organisers arranged for him to speak to the arts graduates, who graduated in the morning, whereas those of us receiving science degrees in the afternoon got to listen instead to an actress, I think she was from The Bill. I have never forgiven them.)

In his essay Gould attacks the image of da Vinci as a "scientist ahead of his time". He points out that da Vinci's fossil studies were driven by his desire to prove a theory that now sounds bonkers from a scientific point of view - that the human body (the "microcosm") and the Earth (the "macrocosm") are connected in some metaphysical way and therefore mirror each other in form and function. In other words, the Earth is a living organism: its soil is like our flesh, its rocks are like our bones, and the water flowing in its rivers is like the blood in our veins.

In studying fossils, da Vinci was looking for evidence to support his macrocosm-microcosm theory. According to Gould: "He featured fossils in order to validate the cherished centrepiece of his premodern worldview - the venerable argument, urged throughout classical and medieval times, for interpreting the earth as a living, self-sustaining 'organism', a macrocosm working by

Enter search term

Search

Include comments in search

Calendar

<< Gennaio 2011 >>

Lu	Ma	Me	Gi	Ve	Sa	Do
27	28	29	30	31	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	1	2	3	4	5	6

[View posts in large calendar](#)

Month List

[2010](#)

[2009](#)

[2008](#)

RecentPosts

[The World's First Cuckoo Clock](#)
Commenti: 4

[Did Gearwheels Inspire Epicycles?](#)
Commenti: 3

[How The Maya Fought The Floods](#)
Commenti: 5

[Portal To A Hidden World](#)
Commenti: 1

[Mummy Tattoos](#)
Commenti: 6

[The Mind Of A Bee](#)
Commenti: 2

[The World's Weirdest Sponge](#)
Commenti: 1

[The Virgin, The Madonna And Paleodictyon](#)
Commenti: 2

[Tale Of A Shipwrecked Pocketwatch](#)
Commenti: 1

[Leonardo's Time Travel](#)
Commenti: 2

the same principles and mechanisms as the microcosm of the human body. Leonardo required, above all, a general device to make the heavy elements, earth and water, move upward against their natural inclination - so that the earth could sustain itself, like a living body, by constantly cycling all its elements, rather than reaching inert stability with heavy elements in permanent layers below lighter elements."

Da Vinci never managed to do this for water - a source of great frustration to him. But in marine fossils found at the tops of mountains, he had found evidence that rocks could move from the bottom of the earth to the top.

So although da Vinci's observations were undoubtedly brilliant, Gould argues, the fact that he was driven by such an "unscientific" theory means it is misguided to think of him as a modern scientist somehow transported into the past. "Leonardo, the truly brilliant observer, was no spaceman, but a citizen of his own instructive and fascinating time."

However the Leonardo biographer [Michael White](#) responded in his 2000 book "[Leonardo: the first scientist](#)" that (you've guessed it from the title) we should recognise him as a true scientist after all.

White says: "Professor Gould claims Leonardo's motivation must surely rob him of the mantle of the genuine scientist, but the fact that Leonardo never succeeded in making irrefutable observations to support his vague idea that water circulated within the Earth and that he never once attempted to fudge the matter, merely adds strength to my conviction that he was a true scientist. Many of Leonardo's peers would have failed to understand that facts must fit and support theory or else that theory is invalidated, whereas Leonardo never contemplated forcing the facts to suit his pet hypothesis."

Much as I admire Gould, I think I agree with White on this. I'm sure there are plenty of theories in science today that will come across as laughable in a few hundred years' time, and who knows, perhaps our whole view of the universe will look simplistic and childish. But as long as we're doing our best to carry out robust experiments and observations and to be guided by the results, I hope future boffins won't judge our efforts too harshly.

Tags:

[E-mail](#) | [Kick it!](#) | [DZone it!](#) | [del.icio.us](#) [Permalink](#) | [Commenti \(2\)](#) | [Post RSS](#) 

Post correlati

[Is the Pantheon a gigantic sundial?](#)

Expert believes the Roman temple was designed to mark the equinoxes

[That Tut conspiracy](#)

How some Friday fun got seriously twisted

[The world's weirdest sponge](#)

The hexagonal fossil Paleodictyon may be the remains of a strange lattice-shaped creature

Commenti

30/09/2010 12.59.38 #

But when the observed facts didn't fit his theory, would he have dropped the theory and tested other ideas? I doubt it (though we'll never know); and of course, you're right: not every 'scientist' today drops a dud theory.

[judith weingarten](#) 

02/10/2010 9.25.56 #

Pingback from [decodingtheheavens.com](#)

Leonardo's time travel

[decodingtheheavens.com](#)

Aggiungi commento

Nome*

E-mail*

Sito web

Nazione

Italy 

Commento	Anteprima	b	<u>u</u>	quote

Avisami quando un nuovo elemento è stato aggiunto

Salva commento