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“Anniversaries”: Leonardo da Vinci (1452-1519) and his possible contributions to geology 500 years ago

By Marianne Klemun, Professor of History of Science, Department for History, University of Vienna, Austria, Secretary-General of the INHIGEO (marianne.klemun@univie.ac.at)



Figure 1: Leonardo da Vinci, “Vergine delle Rocce” (between 1483-1486), Louvre, WIKI Commons.

Everybody knows Leonardo da Vinci, the Mona Lisa, Leonardo’s famous works and his ideas for the construction of wondrous instruments for flight. The famous artist Leonardo was more than a creative man, a seeker after truth, a utopian polymath and an extraordinary figure of his time. Did he contribute to geology? Leonardo is not missing in older history of science handbooks. If we give serious consideration to the question of whether he contributed to geology or not we still could answer either with yes or no depending on the perspective on which we base our considerations. We could argue that Leonardo never published his insights concerning the earth. He was one who recognised fossils as the petrified remains of former living animals. He studied rocks and had very perspective ideas about how mountains originated, and he recorded all his findings in his note-books. He

influenced nobody with his ideas. They remained unknown to his contemporaries and followers. There was no branch of science and no scientific community which was ready to accept these ideas. For another century the origin of fossils remained a mystery. “He was like a man who awoke too

early in the dark, when all the others were still asleep”. This was how Sigmund Freud saw Leonardo in 1910, and in this he was undoubtedly right.

If we read Leonardo’s thoughts in his note-books there is no doubt that he gave careful attention to discovering how mountains grew evolved. If we read what he recorded in his note-books we are impressed by observations such as these on the “formation of mountains”:

“That the rivers have all cut and divided the mountains of the great Alps from one another. This is visible in the order of the stratified rocks, because from the summits of the banks, down to the river, the correspondence of the strata in the rocks is visible on either side of the river. That the stratified stones of the mountains are all layers of clay, deposited one above the other by the various floods of the river. That the different size of the strata is caused by the difference in the floods – that is to say greater or lesser floods.” (Richter 1970, XVI, 980)

The drawings in the notebooks had the function of enabling Leonardo to understand complicated mechanisms in pumps, machines and mills. They also contain his reflections on architecture, his study of optics and Euclidian geometry, the movement and circulation of water, astronomy, the flight of the birds, stereometry, gravity, weight and waves, vegetable morphology, anatomy, water channels and geology. His notebooks are kept in different libraries spread throughout Europe, and today we are constantly impressed by a supremely gifted man whose perception exceeded his contemporaries.

Leonardo did not study geology for its own sake –instead he studied rocks in order to improve the dimensions of his paintings. Observing earth was an ancillary tool for him, and from this perspective we could say that he did not contribute directly to the development of geology. But if we observe his paintings we recognise how carefully he put rocks and mountains in the background of his paintings. He gave those who saw his paintings a specific view of the human in nature. His portraits have educated generations of people over more than 500 years in how to observe both human beings and nature as carefully connected bodies.

For more information:

Gian Battista Vai, "Geological priorities in Leonardo da Vinci's notebooks and paintings", in: Nicoletta Morello, G. Giglia and C. Maccagni (Eds), *Rocks, Fossils and History*. Florence: Festina Lente, 1995, pp. 13-26.

Martin Kemp, *Leonardo*. Oxford: Oxford University Press, 2004.

Jean Paul Richter (Ed.), *The Notebooks of Leonardo Da Vinci*, translated by Richter 2 Vols, Dover: Dover Publications, 1970, XVI, 980. Online Version www.gutenberg.org