

 <https://orcid.org/0000-0001-6749-0399>

Karolina Kolenda

Uniwersytet Pedagogiczny w Krakowie
Wydział Sztuki
e-mail: karolina.kolenda@up.krakow.pl

WILL THE FUTURE BE AQUATIC? UNDERWATER CARTOGRAPHY, VERTICALITY AND *LEONARDO'S* *SUBMARINE* BY HITO STEYERL

Abstract: This text explores the uses of water metaphors in the discourse of digital media on the example of *Leonardo's Submarine*, a three-channel AI-generated video work by the artist and writer Hito Steyerl, presented at the Venice Biennale in 2019, as well as its subsequent installation in a purposefully built virtual reality underwater gallery in winter 2020/2021. The two venues for staging the work are discussed in the context of Steyerl's writings on the change of the European geographical imagination from the Renaissance up to the present day and the role played in this change by digital technologies. Steyerl's ideas about the shift from the horizontal to vertical perspective and the present condition of groundlessness are "submerged" in a watery context of the ocean to test how verticality and groundlessness behave in an underwater environment. Drawing on selected concepts developed in the field of blue humanities, this text seeks to investigate Steyerl's practice as an artist and new media theorist to show how it employs water metaphors to challenge rather than perpetuate our habitual thinking about the ocean and the media used to represent it.

Keywords: Hito Steyerl, Leonardo da Vinci, submarine, blue media

Introduction

This text was initially conceived as a platform for an imaginative encounter between the world's most renowned Renaissance master, Leonardo da Vinci, and one of leading new media artists and theorists working today, Hito Steyerl. However, the very notion of a "platform" as a venue where this couple would converse about art and technology, vision and power, and, most importantly, about various "underwater things" seemed strikingly out of place. Indeed, "platform," as a metaphor of space where ideas meet and clash, builds up an image of a flat surface located above its

surrounding environment. And this is exactly what I will be trying to avoid. Many writers and thinkers who embrace the tenets of blue humanities and other related fields of research today share a belief that one of the major objectives of this area of study is to change prevalent thought patterns, intellectual habits, and the language we use so that our exploration of the water and the things in it is not constricted by what is termed a “terrestrial bias”.¹ In *Sounding the Limits of Life*, Stefan Helmreich argues that the field of blue humanities should immerse theory underwater, which means “not merely theorizing underwater things, but subjecting theory to unfamiliar conditions as well – of pressure, saturation, waterlogging – seeing how it deforms as it merges with what it seeks to describe”.² In an attempt to avoid the “terrestrial bias” in my analysis, I refer to several concepts developed within the field of blue humanities to theorise the practice of thinking *with* the ocean. One them is Melody Jue’s notion of “conceptual displacement,” which allows me to insert (or rather “submerge”) discussed theoretical concepts in a watery environment.

In the following text, I explore two versions of Steyerl’s *Leonardo’s Submarine*: a three-channel AI-generated video work presented at the Venice Biennale in 2019, as well as *Virtual Leonardo’s Submarine*, its subsequent installation in a purposefully built virtual reality underwater gallery, on view at the turn of 2021. The two venues for staging the work are discussed in the context of Steyerl’s essay on the change of the European geographical imagination from the Renaissance up to the present day, titled *In Free Fall*. Her ideas about the shift from the horizontal to vertical perspective and the present condition of groundlessness are “submerged” in a watery context of the ocean to test how verticality and groundlessness behave in an underwater environment.

I will argue that Steyerl’s *Virtual Leonardo’s Submarine* effects what Jue terms a “conceptual displacement,” offering a visual metaphor of the virtual space as a watery milieu. Since Steyerl’s story of Leonardo’s idea for an underwater vessel is narrated through digital technology and in a virtual oceanic environment, I discuss the significance of water metaphors for the discourse of digital media and refer to her use of the term “bubble vision,” developed to discuss the limitations of virtual reality.

The Renaissance man and the deep blue see

Leonardo da Vinci’s invention of the submarine, even though from the contemporary perspective it may seem the epitome of ground-breaking scientific pursuit of the Renaissance era, did not come as the very first attempt to envision how the exploration

¹ See for example: M. Jue, *Wild Blue Media: Thinking Through Seawater*, Duke University Press, Durham–London 2020, p. 4; A. Neimanis, *Bodies of Water: Posthuman Feminist Phenomenology*, Bloomsbury Academic, London–New York 2017, p. 123.

² S. Helmreich, *Sounding the Limits of Life: Essays in the Anthropology of Biology and Beyond*, Princeton University Press, Princeton–Oxford 2016, p. 186.

of the ocean deep might translate into the power wielded on the surface. Neither was Leonardo the first artist of the Quattrocento to suggest such a connection. In his text from 1913, *Airship and Submarine in the Medieval Imagination*, Aby Warburg discusses two 15th-century Burgundian tapestries depicting the scenes from the life of Alexander the Great, one of which contains the story of the king's exceptional excursions effected by way of ingenious machines he ordered to be built specifically for the exploration of the unknown above and below.³ The first is a metal cage attached to griffins, which allows Alexander to rise up above the clouds. Another is a glass barrel in which he is lowered to the bottom of the sea. Although these depictions seem to have their source in a fairy tale, they were, in fact, as Warburg demonstrates, based on what the Western readers accepted as "accurate and well-documented history," corresponding to the facts described in the *Romance of Alexander the Great*, a Greek text translated to more than twenty languages.⁴ This narrative, including numerous fantastic episodes from the story of Alexander's life and conquest, was introduced to the Burgundian court around 1450 by the French writer Jean Wauquelin.⁵ Wauquelin describes that Alexander's venture to the bottom of the sea, where he witnessed the strangest of creatures, allowed him to achieve "greater wisdom" and realise that "strength without cunning is worth little," as demonstrated by "small fish that contrived to overcome greater ones by cunning, although they could never have vanquished them by their own strength alone."⁶ Much like Wauquelin's narrative, the visual transposition of the text featured in the Burgundian tapestry combines the elements of the marvellous and the down-to-earth, phantasms right next to a depiction of the practical aspects of the siege, which Warburg describes as a unified picture plane where "medieval and modern minds meet in a spontaneous symbolic antithesis (...) the expression – however dense the medieval disguise – of a genuine passion for the grandeur of the ancient world".⁷

The differences between the Burgundian tapestry depicting Alexander's "submarine," with its still romanticised and deeply medieval vision of antiquity, and Leonardo's practical more than artistic conception mark a transition to a new stage of the Renaissance imagination, where antiquity is no longer merely a source of motifs, incorporated into a still medieval aesthetic of the French style, but becomes a model of rational thinking and scientific approach to nature. For Leonardo, antiquity is much more than an ideal to be imitated. It is also a source of information on practical

³ A. Warburg, *Airship and Submarine in the Medieval Imagination* [in:] *The Renewal of Pagan Antiquity*, transl. D. Britt, The Getty Research Institute for the History of Art and the Humanities, Los Angeles, CA 1999, pp. 333–338.

⁴ *Ibidem*, p. 333.

⁵ *Ibidem*, p. 334.

⁶ *Ibidem*, p. 335.

⁷ *Ibidem*, p. 336.

solutions, such as engineering, while many of his ideas for weapons emerged as developments of inventions of ancient engineers, such as Archimedes.⁸

The *Codex Leicester*, in large part dedicated to the study of water, its physical aspects, behaviour, sources and transformations, as well as the human use of water, contains multiple scientific analyses, instructions, and designs for devices that could make this use more efficient. The *Codex's* folio 22 (verso) contains suggestions for swimmers made on the basis of an observation of aquatic animals and a description of a snorkel for underwater breathing. Moreover, Leonardo mentions an invention that would allow humans to remain underwater for an extended period of time but refrains from describing it in detail lest it is used to sink ships and gain a dangerous military advantage.⁹ Sketches of this device, included in *Codex Atlanticus* (folio 881 recto and folio 990, verso), are difficult to understand, which was perhaps Leonardo's intention, and show a design of a structure operated by a diver, which would be pulled by a non-military boat in the vicinity of an enemy ship. When in proximity, the diver would direct the submarine towards the hull of the enemy ship undetected and use secret sabotage devices to sink it.¹⁰

Leonardo's Submarine and the transformation of the geographical imagination

Steyerl's three-channel video work *Leonardo's Submarine*, presented at the Venice Biennale in 2019, offers a view from aboard Leonardo's vessel, generated by Artificial Intelligence video processing. It starts with digitally rendered images of underwater exploration of coral reefs, accompanied by the sound of sonar, and voice-over narrating the story of Leonardo's invention. Subsequent shots show the Venice waterfront and a part of the MOSE protection gate. AI-generated images of Venetian buildings, with their facades reflected in the water, are colourful but distorted, as if seen from beneath the surface. A female voice, which speaks in Italian in a manner reminiscent of a speech generator, comments: "MOSE is expected to protect Venice from very high tides: but it is plagued with concern about corruption and dysfunction".¹¹ The following shots show page 990 from *Codex Atlanticus* with an explanation of the technology invented by Leonardo, which was to remain hidden within his notes for the next 500 years.

⁸ D.L. Simms, *Archimedes' Weapons of War and Leonardo*, "The British Journal for the History of Science" 1988, vol. 21, no. 2 (June), pp. 195–210.

⁹ *Water as Microscope of Nature: Leonardo da Vinci's Codex Leicester*, exhibition, 30.10.2018–20.01.2019, Uffizi, Florence, Museo Galileo, <https://mostre.museogalileo.it/codiceleicester/en/water/50-leonardo-s-submarine> (accessed: 1.02.2021).

¹⁰ A 3D model of Leonardo's submarine is available at Museum Leonardo3 website: <http://www.leonardo3.net/en/13-works/machines/1467-mechanical-submarine.html> (accessed: 9.02.2021).

¹¹ H. Steyerl, *Leonardo's Submarine*, multi-channel video, duration variable, Biennale de Arte, Venice 2019.

The story of Leonardo's initial plan to offer his invention to Venice and his subsequent decision to keep it secret works as an evident commentary on the connections between the contemporary art world and the military-industrial complex, of which the German artist has been a consistent and outspoken critic.¹² In particular, Steyerl draws a parallel between the Italian artist's innovative but potentially destructive design and the way the high-tech company Leonardo S.p.A., partially owned by the Italian government, has operated under his name doing exactly what the Renaissance genius had tried to avoid.¹³ The dangerous liaison between art and power, the creative potential and the destructive outcome, is one of the leading themes of Steyerl's work, highlighting how the contemporary use of Artificial Intelligence and digital technologies as weapons is, sadly, merely one more episode in a well-known story, the story of when what was devised to serve knowledge and development is actually employed to wreak havoc and, time and again, make Leonardo's fears of the evil nature of man justified. However, in the following paragraphs, I would like to focus on other issues addressed by *Leonardo's Submarine*, issues that have become particularly pronounced in another staging of this work, presented in a specially designed virtual space – a virtual underwater environment – available to viewers on respective websites of Esther Schipper Gallery and Andrew Kreps Gallery from November 2020 through to January 2021 as *Virtual Leonardo's Submarine*. For this instalment of the work, Steyerl constructed a virtual space of the ocean where, equipped with a VR headset or with a standard web browser, viewers can dive, accompanied by the artist's avatar, and explore the underwater environment. Inserted inside this oceanic cinema is the original three-channel video. I would like to discuss the two versions of *Leonardo's Submarine* in reference to Steyerl's earlier text on the transformation of the modern geographical imagination, namely *In Free Fall*. This will help me examine the problematisation of the digital virtual media in Steyerl's practice and highlight that it is increasingly informed by oceanic metaphors.

Leonardo's Submarine speaks to the way in which, in Leonardo's lifetime, as well as partly due to his legacy, the geographical imagination transformed radically, together with the changing (tightening) relationship between mapping and controlling, cartography and power.¹⁴ Crucial in this process of perfecting maps, representing the world more completely in order to extend the expanse of land under one's control,

¹² Steyerl has written extensively on this topic. See, for example, her book *Duty Free Art: Art in the Age of Planetary Civil War*, Verso, London–New York 2017.

¹³ The parallel concerns primarily the fact that in 1515 Leonardo designed the submarine to help Venice protect itself against the attacks from the Ottoman Empire, while in the 21st century Leonardo S.p.A., specialising in weapons, defence, and security technology, supplied weapons which the Turkish army used against Syrian civilians. See: H. Steyerl, *Virtual Leonardo's Submarine*, exhibition press release, 27.11.2020–9.01.2021, Esther Schipper Gallery, Berlin, Andrew Kreps Gallery, New York, <https://andrewkreps.viewingrooms.com/viewing-room/21-hito-steyerl-virtual-leonardo-s-submarine/> (accessed: 10.02.2021).

¹⁴ Notable among numerous studies of this cartographic revolution in the era of colonial expansion are: F. Lestringant, *Mapping the Renaissance World: The Geographical Imagination in the Age*

was the invention of perspective and the art of translating observed three-dimensional reality into two-dimensional diagrams, and then – back again – into mimetically represented illusion of three-dimensional space in a painted image.¹⁵ In her text, *In Free Fall: A Thought Experiment on Vertical Perspective*, Steyerl describes horizontal perspective and panoramic viewing as a singular aspect of early modernity that has been challenged or even entirely removed with the advent of technologies such as space travel, the GPS, satellites, Google Earth, drones, etc.¹⁶ What characterises our age, claims Steyerl, is “a prevailing condition of groundlessness. (...) a permanent, or at least intermittent state of free fall for subjects and objects alike”.¹⁷ When “traditional modes of seeing and feeling are shattered” and the stable horizon is lost, so are modernity’s concepts of “subject and object, of time and space”.¹⁸ Steyerl argues that the linear perspective that dominated the Western vision since the Renaissance has recently been “supplemented (and often replaced) by multiple perspectives (...) and divergent vanishing points”.¹⁹ At present, the dominant perspective is vertical rather than horizontal, while the “eyes” of satellites and drones float in space, making our battlefields suspended in the air rather than set firmly on the ground: “Vertical sovereignty splits space into stacked horizontal layers, separating not only airspace from ground, but also splitting ground from underground, and airspace into various layers”.²⁰ When traditional mapping no longer translates into immediate advantage over one’s opponents, the ability to wield war from above is what determines if we win or lose.

How can Steyerl’s observations from this text be referred to *Leonardo’s Submarine*? I suggest that her reflections about the shift from solid ground and fixed vantage point to the present state of groundlessness and verticality resonate in the video work both on the level of the subject matter – in the premise that the accuracy of vision and mapping is the source of power and control – and, more importantly, on the level of the construction of the visual experience of the work for the viewer. The three-channel video multiplies the observer’s vantage points and complicates the

of Discovery, transl. D. Fausett, Polity Press, Cambridge 1991; D.E. Cosgrove, *Geographical Imagination and the Authority of Images*, Franz Steiner Verlag, Stuttgart 2006.

¹⁵ On the relationship between Renaissance painting and cartography see for example: N. Alfrey, S. Daniels (eds.), *Mapping the Landscape: Essays on Art and Cartography*, University Art Gallery, Nottingham 1990; D.E. Cosgrove, *Landscape and the European Sense of Sight – Eyeing Nature* [in:] K. Anderson, M. Domosh, S. Pile, N. Thrift (eds.), *Handbook of Cultural Geography*, Sage, London 2002, pp. 249–268; W.J.T. Mitchell, *Imperial Landscape* [in:] W.J.T. Mitchell (ed.), *Landscape and Power*, The University of Chicago Press, Chicago 2002, pp. 5–33.

¹⁶ H. Steyerl, *In Free Fall: A Thought Experiment on Virtual Perspective*, “e-flux” 2011, no. 24 (April), <https://www.e-flux.com/journal/24/67860/in-free-fall-a-thought-experiment-on-vertical-perspective/> (accessed: 24.02.2021).

¹⁷ Ibidem.

¹⁸ Ibidem.

¹⁹ Ibidem.

²⁰ Ibidem.

viewing process through distortions of the image and the impression of moving together with the waves, up and down, back and forth. The viewer floats together with the submarine yet is able to switch from one screen to another, as if looking around through the submarine windows. The impression of being immersed underwater with no stable ground to stand on increases significantly when the screens are submerged in the VR ocean gallery of *Virtual Leonardo's Submarine*. If vertical perspective is translated into “water terms,” floating in mid-air turns into floating underwater and verticality becomes depth. The experience of groundlessness, Steyerl argues in the final paragraphs of *In Free Fall*, has potentially liberating aspects, especially as a metaphor for the digital artist, but also, more broadly, as a new paradigm of social life where “philosophy’s obsession with earth and origin” is rejected, while “the most violent fear of the groundless and bottomless” is dismissed. I suggest that submerging *Leonardo's Submarine* in a bottomless virtual ocean works for Steyerl as a means to test the assumption that the lack of stable ground, however confusing or shocking at first, can also mean freedom from fixed positions and a possibility of building new “shifting formations.”²¹ The ocean seems to be a particularly fitting environment for testing the potential of groundlessness as a liberating force, since – as Melody Jue, the author of *Wild Blue Media* suggests – “the conditions of mediation we find in the ocean may be unruly, testing the limitations of a human point of view.”²²

The material and the virtual: submerging the virtual “bubble vision”

Virtual Leonardo's Submarine, with the immersion of multiple screens in the groundless underwater gallery, challenges viewing from stable vantage points, allowing the observer to switch from screen to screen, but also to freely move around them in fully three-dimensional environment, watching the video from the bottom up or down from near the surface. This mimics the actual experience of diving, where the world around us is never seen as if it appeared on a flat immobile plane. As Jue claims, in the water, our habit of maintaining a vertical bodily position is challenged by the horizontality required to float.²³ Yet, at the same time, our perspective and perceptual habits change from those typical when regarding a flat plane or horizon from a fixed position, a panoramic view apprehended with one scanning movement of our eyes, towards a more multi-dimensional and multi-sensory, or bodily experience. I refer here to Jue as an author whose conceptualisation of what blue humanities can bring into the discussion of digital media resonates with my attempt to present *Virtual Leonardo's Submarine* as a work concerned both with the ocean as a metaphor as well as with the ocean as a material environment. Jue argues that her project – a milieu-specific analysis – “dif-

²¹ Ibidem.

²² M. Jue, *Wild Blue Media...*, op. cit., p. XI.

²³ Ibidem, p. 2.

fers from the previous work in the ocean humanities by engaging with the ocean as an environment for thought rather than as an object of analysis or region for the study of cultural representations”.²⁴ Advocating an intellectual practice of “thinking through the ocean,” the author of *Wild Blue Media* argues for a “conceptual displacement,” an act of “submerging theory underwater,” which “works by amphibiously holding the tension between the milieu specificity of the ocean with the milieu specificity of the observer’s normative environment”.²⁵ Following her lead, I read Steyer’s work as an exercise in how to think about the ocean as an actual, material environment, but also as a metaphor that helps us understand the nature of virtual reality and rethink the way our body and vision function therein.

Virtual Leonardo’s Submarine emerged as a work that drew on and developed Steyerl’s earlier reflections on virtual reality, which she presented during a lecture delivered in 2018 under the title *Bubble Vision*.²⁶ Taking as her starting point Leonardo’s painting of *Salvator Mundi*, which recently attracted media attention due to controversial attribution and a record-breaking price for which it was sold at a Christie’s auction,²⁷ Steyerl takes a closer look at a glass orb held by Christ in his hand and compares it to the lenses of VR goggles. Normally, for optical reasons, the image inside a glass orb is distorted. But so is the image of the world as seen from the inside of an orb. Whether from the inside of a geodesic dome or as a VR-experience, contemporary viewers increasingly often perceive the world from inside a bubble. The specific “bubble vision” produced by VR devices, argues Steyerl, is both an extension as well as a radical collapse of the modern horizontal, linear vision in that it similarly places the human observer in the centre, with the world as if built around and for her, yet it also eliminates the physical body of the observer from the scene: one can be everywhere without actually being anywhere. This way, the observer’s vision is still in place, yet her body is not, because to be automated, one must be first eliminated.²⁸

Since Steyerl’s theoretisation of virtual reality as a “bubble vision” informed her practical investigations of this technology in *Virtual Leonardo’s Submarine*, I would like to connect these two and conceive them vis-à-vis each other as “watery” meta-

²⁴ Ibidem, p. 16.

²⁵ Ibidem, p. 7.

²⁶ H. Steyerl, *Bubble Vision*, lecture within the frameworks of the Penny Stamp Distinguished Speaker Series, Stamps School of Art & Design, University of Michigan, 31.01.2018, https://youtu.be/T1Qhy0_PCjs (accessed: 10.02.2021).

²⁷ For an outline of the attribution debate see for example: D. Alberge, *Leonardo da Vinci Expert Declines to Back Salvator Mundi as His Painting*, “The Guardian”, 2.06.2019, <https://www.theguardian.com/artanddesign/2019/jun/02/leonardo-da-vinci-expert-carmen-bambach-says-she-wont-back-salvator-mundi-as-his-painting> (accessed: 11.02.2021).

²⁸ Ibidem. To draw this conclusion Steyerl refers to the *Ghost in the Shell* franchise, where the protagonist is eliminated as a human body only to be automated as a cyborg. Curiously, in the original animated motion picture version of this story, to feel truly herself, Major dives deep underwater where she can escape the incessant noise of the digital data to which she is connected. See: *Ghost in the Shell*, dir. Mamoru Oshii, 1995, 82 min.

phors that organise the artist's treatment of virtual media as both immersive and isolating, liberating and obfuscating. If the immersive environment of the virtual ocean speaks to the way VR technology multiplies vantage points and breaks with the habits of horizontal perspective, then the concept of "bubble vision," on the contrary, highlights the limitations of human desire to build the world around us. Indeed, if the experience of virtual reality is less like diving in an unknown world, where our perceptual habits are challenged, and more like observing the underwater from the safety of our bubble, not unlike Alexander from his glass barrel, then important lessons of blue humanities as a means of understanding virtual media might be missed. One of such lessons is certainly, as Jue argues, "to measure oneself as an observer against new conditions of immersion".²⁹ This is most emphatically not another anthropocentric position, another version of the Renaissance idea of the human body and human vision at the centre of all things, but a conceptualisation of the human subject "as a participant in a buoyant, watery, and pressurized milieu".³⁰

Opening up to different environments and other, partial perspectives entails imagining how the world is experienced by non-human subjects for whom the water is a natural habitat. In a sense, by immersing the story of how Leonardo *did not* play a part in enabling human control of the depths of the ocean, Steyerl perhaps also speculates on how this narrative would be perceived by subjects for whom the underwater is a natural environment. As an experiment in making art for depth-dwellers, the work echoes Vilém Flusser's 1987 essay *Vampyroteuthis Infernalis* in that it seeks to challenge the anthropocentric habits of media theory by reimagining the conditions of viewing as watery and the nature of the observer as non-human.³¹ In this book, Flusser speculates on what typically human achievements and inventions, such as philosophy and the media, would look like if they were the domain of a water-dwelling organism, the vampire squid. This unusual thought experiment begs important questions on the validity of water metaphors we use to talk about the media. For instance, what is the purpose of water metaphors used to describe the human experience of digital media if they are formulated from an anthropocentric, earth-bound perspective? Is construing virtual reality as "immersive" justified if such immersion relates to a limited number of our senses and ignores the sense of touch and pressure, or the crucial challenge of having to breathe differently?

Plunging in the "sea of data" and other oceanic metaphors

I started my discussion with an attempt to examine what happens when the process of transition from the horizontal to vertical perspective is submerged in the (virtual) watery milieu onboard Leonardo's submarine. Our notions of space have been power-

²⁹ M. Jue, *Wild Blue Media...*, op. cit., p. 65.

³⁰ *Ibidem*, p. 66.

³¹ V. Flusser, *Vampyroteuthis Infernalis*, transl. R. Maltez Novaes, Atropos, New York 2011.

fully transformed by aerial viewing and digitally mediated satellite imagery (among others), making our vision suspended more than grounded, however stable ground still remains a valid reference point, only if to lament its absence in the present condition of groundlessness. On the other hand, the discourse of digital media is invested with multiple watery metaphors, such as fluidity, immersion, information flow, or the sea of data.³² Why have then our notions of the virtual been so powerfully driven by terrestrial bias, even in cases when the virtual serves the function of rendering the digital imagery of the ocean? Can works such as *Virtual Leonardo's Submarine* help us imagine a different cartography of the ocean and break the bubble from within?

In *Water Worlds: Human Geographies of the Ocean*, Jon Anderson and Kimberly Peters suggest that the terrestrial bias that informs our approach to the ocean is inherent in the very term “geography” in that the prefix (geo-) asserts the “sedentary metaphysics” that underlies the natural sciences.³³ It is their claim that geographers need to reformulate the language they use and “develop a new fluid language to understand our water world.” To start with, they propose a conceptual shift from writing about the earth to writing about the ocean: from *geography* to *thalassography*.³⁴

Meanwhile, despite the wide availability of 3-D technologies, contemporary mapping of the ocean still largely ignores its milieu as three-dimensional, where the vertical – the depth of the ocean – is as important as is its horizontal expanse. For instance, the adaptation of Google Street View to the space of the ocean translates possible diving routes into “streets,” a rendering that confounds the multiplicity of axes and distorts the key aspects of the experience of water, such as the temperature, the pressure, the dimmed light, and the specificity of human body’s movement in this environment.³⁵ This distortion comes as a direct consequence of the terrestrial bias: a result of making the ocean conform to the rules of *geo-graphic* rather than milieu-specific description. It also illustrates that, to a significant degree, our perception of the ocean still bears the mark of the Renaissance cartographic imagination, which perceived the ocean as a surface to be mapped, rather than as a depth to be fathomed. When he drafted his invention, Leonardo was wary of the danger that some actors might use the submarine to wield it as a weapon. Its effectiveness as a weapon would depend on the very fact that the ocean potentially offered information about and access to those unaware, uninformed, and therefore defenceless. The ocean could work

³² For a discussion of the use of natural metaphors in media discourse see: U.K. Heise, *Unnatural Ecologies: The Metaphor of the Environment in Media Theory*, “Configurations” 2002, vol. 10, pp. 149–168. On the metaphoric as well as material relationship between media and water see: J. Garde-Hansen, *Media and Water: Communication, Culture and Perception*, I.B. Tauris, London–New York 2021, pp. 75–85.

³³ J. Anderson, K. Peters, ‘A Perfect and Absolute Blank’: *Human Geographies of Water World* [in:] J. Anderson, K. Peters (eds.), *Water Worlds: Human Geographies of the Ocean*, Ashgate, Farnham 2014, p. 11.

³⁴ Ibidem, p. 10.

³⁵ See the discussion of Google Street View Ocean in: M. Jue, *Wild Blue Media...*, op. cit., pp. 129–154.

as an “invisibility cloak” to those who mastered the skill of breathing underwater. Even to nations whose very livelihoods depended on it, the water itself – as a medium of information – was a threshold, while its depths unknown and unfathomed.

With the invention of technologies such as echolocation, satellite photography, and laser scanning our knowledge of the ocean has significantly increased, but has it become milieu-specific? Do available technologies of mapping the ocean effectively translate the watery environment into our earth-bound language? Are we able to immerse these technologies in the ocean or do we still merely look at its surface? The plethora of watery metaphors that are employed to conceptualise the digital media would suggest a kind of kinship that promises an affirmative answer to these questions. Meanwhile, although the language of “fluidity” that permeates the discourse of digital media shapes primarily our imagination, our conception of the data as “fluid” and the digital environment as “immersive,” it has also other, much more tangible effects. Jue argues that “by setting up water and data to share a natural equivalence or interchangeability, ecological descriptive imagery naturalises digital technologies and processes”.³⁶ Joanna Garde-Hansen raises a similar concern when she writes that the use of hydrosymbolic metaphors naturalises, in turn, the confusion we might feel in the “sea of information”; if we think about the media as liquid, we might, by extension, think about our lives as such.³⁷

This brings me back to the VR experience of diving in the oceanic screening room, where the digitally-generated view from Leonardo’s submarine was immersed in yet another – also virtual and oceanic – environment. I argue that this twofold immersion, a doubled underwater perspective, strives to challenge the work of the watery metaphor, to catch it “red handed,” so to speak, and expose its mechanics right when it is about to exert its framing power. In so doing Virtual Leonardo’s Submarine places the “immersiveness” of virtual reality in inverted commas; without illusions that the “bubble vision” can be transcended from within the VR medium itself, it perhaps prepares us for a possible future when the digital media will truly become aquatic, in a material more than metaphorical way.

Bibliography

- Alberge D., *Leonardo da Vinci Expert Declines to Back Salvator Mundi as His Painting*, “The Guardian”, 2.06.2019, <https://www.theguardian.com/artanddesign/2019/jun/02/leonardo-da-vinci-expert-carmen-bambach-says-she-wont-back-salvator-mundi-as-his-painting>.
- Alfrey N., Daniels S. (eds.), *Mapping the Landscape: Essays on Art and Cartography*, University Art Gallery, Nottingham 1990.
- Anderson J., Peters K., *‘A Perfect and Absolute Blank’: Human Geographies of Water World* [in:] J. Anderson, K. Peters (eds.), *Water Worlds: Human Geographies of the Ocean*, Ashgate, Farnham 2014.

³⁶ M. Jue, *Wild Blue Media...*, op. cit., p. 115.

³⁷ J. Garde-Hansen, *Media and Water...*, op. cit., pp. 24–30.

- Cosgrove D.E., *Geographical Imagination and the Authority of Images*, Franz Steiner Verlag, Stuttgart 2006.
- Cosgrove D.E., *Landscape and the European Sense of Sight – Eyeing Nature* [in:] K. Anderson, M. Domosh, S. Pile, N. Thrift (eds.), *Handbook of Cultural Geography*, Sage, London 2002.
- Flusser V., *Vampyreuthis Infernalis*, transl. R. Maltez Novaes, Atropos, New York 2011.
- Garde-Hansen J., *Media and Water: Communication, Culture and Perception*, I.B. Tauris, London–New York 2021.
- Heise U.K., *Unnatural Ecologies: The Metaphor of the Environment in Media Theory*, “Configurations” 2002, vol. 10.
- Helmreich S., *Sounding the Limits of Life: Essays in the Anthropology of Biology and Beyond*, Princeton University Press, Princeton–Oxford 2016.
- Jue M., *Wild Blue Media: Thinking Through Seawater*, Duke University Press, Durham–London 2020.
- Lestringant F., *Mapping the Renaissance World: The Geographical Imagination in the Age of Discovery*, transl. D. Fausett, Polity Press, Cambridge 1991.
- Mitchell W.J.T., *Imperial Landscape* [in:] W.J.T. Mitchell (ed.), *Landscape and Power*, The University of Chicago Press, Chicago 2002.
- Neimanis A., *Bodies of Water: Posthuman Feminist Phenomenology*, Bloomsbury Academic, London–New York 2017.
- Simms D.L., *Archimedes’ Weapons of War and Leonardo*, “The British Journal for the History of Science” 1988, vol. 21, no. 2 (June).
- Steyerl H., *Bubble Vision*, lecture within the frameworks of the Penny Stamp Distinguished Speaker Series, Stamps School of Art & Design, University of Michigan, 31.01.2018, https://youtu.be/T1Qhy0_PCjs.
- Steyerl H., *Duty Free Art: Art in the Age of Planetary Civil War*, Verso, London–New York 2017.
- Steyerl H., *In Free Fall: A Thought Experiment on Virtual Perspective*, “e-flux” 2011, no. 24 (April), <https://www.e-flux.com/journal/24/67860/in-free-fall-a-thought-experiment-on-vertical-perspective/>.
- Steyerl H., *Virtual Leonardo’s Submarine*, exhibition press release, 27.11.2020–9.01.2021, Esther Schipper Gallery, Berlin, Andrew Kreps Gallery, New York, <https://andrewkreps.viewingrooms.com/viewing-room/21-hito-steyerl-virtual-leonardo-s-submarine/>.
- Warburg A., *Airship and Submarine in the Medieval Imagination* [in:] *The Renewal of Pagan Antiquity*, transl. D. Britt, The Getty Research Institute for the History of Art and the Humanities, Los Angeles, CA 1999.