“An ethereal sea reaching over the whole world” : Fluid Atmospheres in Jules Verne’s Vingt Mille Lieues sous les mers

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What constitutes the atmosphere? Now understood to mean the “spheroidal gaseous envelope surrounding any of the heavenly bodies,”1 the atmosphere was once conceived as the “mass of aeriform fluid” that emanated from and subsequently wrapped itself around the earth.2 Its obsolete meaning, which designates “a supposed outer envelope of effective influence surrounding various bodies,” underscores how the atmosphere is sometimes taken as a force that can influence those who are subjected to its presence. It is indeed a physical force, as the atmosphere exerts a measurable physical pressure upon the earth’s surface. Its quantifiable presence is obfuscated by a secondary meaning, which reminds us that the atmosphere is also a “surrounding mental or moral element, environment, [...] a prevailing psychological climate [or] a pervading tone or mood.” And over the course of the last century, the term has adopted a specialized meaning in the field of technology and telecommunications, where the atmosphere is the combination of “background sounds that evoke a particular mood, impression, [or] setting in a broadcast.”3 Since the word atmosphere first appeared in the early seventeenth century, its meaning has expanded to encompass affective, physical, and sonic valences.

In nineteenth-century Europe, the atmosphere was understood to be an elastic fluid. Multiple treatises sought to explain the atmosphere and its variations to a wide readership; Jules Verne was an avid reader of such materials, and his novels are famous for their blend of scientific knowledge and adventure narrative. Scholars such as Daniel
Compère have meticulously gathered the threads that tie Verne’s texts to his peers’ scientific publications; while tracing these influences has proven an invaluable aid to researchers, this article draws attention to the broader patterns that show how a sustained scientific interest in the atmosphere infiltrated popular literature.

Among the popular texts that circulated in England and in France, Camille Flammarion’s works on meteorological phenomena, astronomy, and physics were some of the most well-received and widely translated studies. L’Atmosphère (published in 1871, the same year that Jules Verne’s Vingt mille lieues sous les mers was first released as a richly illustrated octavo) opens with a preface that reveals the period’s perception of the singular experience of living within an element that cannot be seen but is most certainly felt:

The Atmosphere gives life to earth, ocean, lakes, rivers, streams, forests, plants, animals, and men; in and by the Atmosphere every thing has its being. It is an ethereal sea reaching over the whole world; its waves wash the mountains and the valleys, and we live beneath it and are penetrated by it. It is the Atmosphere which makes its way as a life-giving fluid into our lungs, which gives an impulse to the frail existence of the new-born babe, and receives the last gasp of the dying man upon his bed of pain.

The atmosphere — a liquid, invisible, and elastic substance — sat atop the oceans and differed from water by being invisible, but it was subject to the laws that regulated aqueous bodies. James Glaisher, a meteorologist working at the Greenwich Observatory, edited the English edition of Flammarion’s book, which was published in London in 1873. In both languages, the preface does more than introduce scientific observations; it also underscores how the atmosphere, understood as a life-giving ubiquitous element, has the power to transcend boundaries. When the atmosphere is perceived as a vast liquid substance that envelops the earth, the fine line that divides the sea from the sky is erased and a continuum emerges. As the anthropologist Tim Ingold writes, the elimination of such fixed divisions transforms surface areas from “interfaces” into “zone[s] of admixture and intermingling.” These liminal spaces blur the boundaries that we seek to affix in order to clearly define and contain invisible yet material forces that surround us.

If the atmosphere is a thinned, rarefied version of the ocean, then the boundaries that separate these two environments are stretched out and erased. The dividing line — like a gossamer membrane, now punctured — becomes a fiction that perpetuates the illusion of difference where there is only a variation in degree. A popular British almanac described the atmosphere’s composition as a “combination of two distinct expansible gases, the interstices of which are penetrated by ever-varying proportions of condensable elastic vapour.” Etymologically, “atmos” means “vapour,” and there are indeed tiny droplets of water hanging in the atmosphere. In this light, the space in which the droplets concentrate and become fluid again is where the sky ends and fluid masses begin. More significantly, however, is the concept of an elastic overflow into interstitial space, which becomes a zone of mingling rather than a hardened separation between different elements. In such a framework, the atmosphere’s invisibility does not imply an absence or an immateriality; rather, it points to a broader cycle with varying pressures, flows, and altered states.

In Vingt mille lieues sous les mers, reading the atmosphere as a fluid medium transforms rigid barriers into Ingold’s “zones of admixture and mingling,” best captured by Captain Nemo’s motto: mobils in mobile, or “movement in the moving element.” When the Nautilus inhabits the purported boundary between the ocean and the atmosphere, it
crystallizes the continuity of the two elements. Considered in terms of different degrees of density, the sea and the sky blend into one another along a continuum. As a thickened atmospheric space rather than an alien underworld, the ocean opens itself to human exploration and becomes permeable. Thus, the impenetrability of the ocean is negated by the potential offered by this fluid atmosphere, and the submarine environment becomes a wonderful world to be discovered rather than an inscrutable abyss. As a continuous (if varying condensed) substance rather than a wholly different presence firmly separate from the earth and the ocean, the fluid atmosphere troubles the myth of the sealed membrane — the definite boundary, skin, or shell that separates the self from the environment. More than this, however, *Vingt mille lieues sous les mers* negotiates the medium — and the Nautilus and Nemo as beings caught in between — through the atmosphere.

### II. Membranes

The Nautilus provides a seemingly hermetic environment that pierces the atmosphere’s different thicknesses; its technological powers produce its capacity for interstitial existence. The Nautilus joins spaces that are generally held apart as incompatible and enfolds Doctor Aronnax, his assistant Conseil, and Ned Land, muffling the abyss that surrounds them. Lavish furnishings, luxurious meals, and the ship’s safe interior always welcome the doctor and the Captain after their expeditions. Far from being a spartan environment, the Nautilus is an opulent ship, replete with rare artworks, vast collections that no land-based museum could ever hope to gather: a library of twelve thousand volumes, bound in uniform leather; paintings by da Vinci, Holbein, Titian, and Géricault; bronze statues and other precious artworks; countless seashells, conches, and pearls all adorn the submarine’s library and salon. Of Verne’s tendency to transform his interiors into cocoons, Barthes writes: “Verne had an obsession for plenitude: he never stopped putting a last touch to the world and furnishing it, making it full with an egg-like fullness. His tendency is exactly that of an eighteenth-century encyclopaedist or of a Dutch painter: the world is finite, the world is full of numerable and contiguous objects.” And in a world wherein the atmosphere is a liquid, the world is finite: nothing is added to the system, and nothing is ever truly lost, as the atmosphere absorbs and redistributes all that it contains within an infinite repetitive process of creation and destruction. Still, this fullness is in constant motion, just as the Nautilus is perpetually travelling beneath the waves. Nemo’s art and book collection are the most stationary parts of the Nautilus, as the captain ceased adding to them the day he began his voyage. The nineteenth century’s obsession with cataloguing all manner of things and beings imposes another set of artificial boundaries to the ineffable and unimaginable fullness of the world — these limits are also a comfort.

Verne’s heroes, who cruise the deep seas as they munch on delicacies and peruse rare books, facilitate the exploration of the unknown. The mysteries at the bottom of the ocean are no longer inaccessible and frightening; rather, they become a parade of colours and discoveries to be broadcast through a vast window to a comfortably seated audience. While the Nautilus encloses its travellers, its function as a container that translates the upper regions of the atmosphere into the ocean’s depths further perpetuates the myth of containment modes of habitation also promote. From the confines of the Nautilus’s parlour, Aronnax and his friends can describe the wonders beyond their windows without
risking their lives. As Barthes notes, the “the pleasure of confinement reaches its paroxysm when, from the heart of this seamless interior, one can see the vague exterior of the water through a great window, and define in one fell swoop the interior by its opposite.”

Much like chimneys unite two opposing realms of existence, the Nautilus “connects, but in order precisely to keep at a distance, two regimes of space.” It acts as an agent that reproduces the tropes of landlocked existence underwater, erasing the otherworldly qualities of marine existence. In other words, the Nautilus’s exterior binds its bourgeois interior to a membrane that, while it appears to be perfectly sealed, carries within it the remnants of a former landlocked existence.

The Nautilus is never fully separated from the earth the Captain seeks to reject, as the atmosphere within, without, and around must be replenished on a regular basis. Nemo brags that he could have used the phenomenal electric powers at his disposal to produce his own air, but that he chooses to return to the surface whenever his heart desires: “Oh, I could manufacture all the air I need for my consumption, but that would be pointless since I go back up to the surface whenever I want. Powerful pumps [...] store air in special tanks, thus allowing me to remain at the deepest levels as long as I wish.”

The Nautilus’s rhythmic resurfacing becomes a hidden link that, paradoxically, ties Nemo to the very thing he rejects.

Despite his attempt to remain exclusively apart from the earth by living underwater — ensconced in a milieu (a middle and an environment) of his choosing — Nemo must return to the border between the air and the sea in order to live. He skims the surface, itself the periphery between two elements. The space where the atmosphere becomes denser is where the Nautilus straddles the ocean, between waves and clouds:

For several hours, the Nautilus’s prow cut the whitish waves, and I noticed that it floated soundlessly over the silky water, as if sliding over those foamy areas sometimes produced in bays by the collision of currents and counter-currents.

At about midnight the sea suddenly resumed its normal colour, but behind us, as far as the eye could see, the sky reflected the whiteness of the waves for a long time as if filled with the dim gleams of an aurora borealis.

Here, the Nautilus is doubly in-between. As the sky takes on the characteristics of the Milky ways, it becomes difficult to determine where the atmosphere ends and where the water begins. The sea reflects and refracts the sky’s dying light, which mirrors the white gleams and produces a new kind of aurora borealis. This new phenomenon no longer requires the sun’s magnetic storms to react with the earth’s upper atmosphere; instead, the atmosphere turns in upon itself, thickened and extended beyond the horizon’s limits. The Nautilus cuts across the foamy middle that transcends the fine line between liquid and gaseous. The submarine slices through this interstitial space until midnight — the point in time that is the most in-between — quietly tearing a line through the interminable whiteness of its nautical and aerial atmosphere, both fluid and encompassing. The Nautilus occupies a frothy space that comes into existence as two substances — air and water — imperfectly blend with one another, creating a new middle that marks the continuum between the atmosphere’s varying densities.

By siphoning the atmosphere and carrying it to the ocean, the Nautilus allows air and water to trade places, hinting at their life-giving connectivity and similarities. Such a reversal is especially evident after Nemo brings Aronnax out of the submarine and onto the ocean floor for the first time:

The light astonished me with its penetration, for it lit up the ground as far as thirty feet below the surface. The sunlight traversed the aqueous substance easily but its
colours dissipated. I could clearly see objects 100 meters away. Beyond that, the depths were tinted in fine shades of ultramarine, becoming bluer in the distance and fading into a sort of nebulous darkness. The water surrounding me was really a sort of air, denser than the terrestrial atmosphere but almost as clear. I could see the calm surface of the sea above my head.20

The terrestrial atmosphere and the aqueous one are practically interchangeable. Water does not hinder Aronnax physically, and he is free to wonder at the marvels before him. Above, the “calm surface of the sea” mirrors the vault of the sky, clear and blue. Even Aronnax’s breath within the diving suit is returned to the Nautilus; it is not expelled as an air bubble into the water. His respiration’s seamless connection to the submarine reinforces the illusion that the ocean is nothing more than a denser kind of air, an extreme thickening of the atmosphere. This illusion pulls down the sky and transposes it upon the ocean, making the latter fulfill the atmosphere’s duties. These different layers, seen from the bottom of the ocean floor, flatten the differences between the ocean and the sky; it all becomes an overarching blue vault. The entire world is immersed in the life-giving fluid that thickens and thins along its vertical axis.

In such a liquid world, solid earth is exceptional. Nemo wants to divorce himself completely from land, terra firma, which opposes his Mobilis in mobile. As the captain notes, “The sea is everything. It covers seven-tenths of the terrestrial globe.”22,23 The sea is the moving element that surrounds immovable landmasses, yet the atmosphere encompasses both. The air Nemo breathes becomes an invisible but omnipresent umbilical chord that both surrounds and fills the Nautilus, despite many efforts to totally break from the Earth’s surface. The atmosphere aborts the radical caesura that Nemo seeks to enact — it is inescapable, because it is necessary to human existence: it is, in Flammarion’s terms, the “life-giving fluid.”24 Although landlocked people “live beneath” the “ethereal sea reaching over the whole world,”25 Nemo’s tanks syphon the atmosphere below the material sea. In its periodical trips to the surface, the Nautilus punctures the membrane that creates the illusion of impermeable boundaries. Thus, the submarine creates a chiastic coupling: through its tanks, the atmosphere penetrates the ocean, and the ocean suffuses the atmosphere.

III. Between

The interplay between atmospheric and oceanic fluidities highlights the tenuous imposition of boundary lines. As we gradually shed the idea of the atmosphere as fluid and moved towards an understanding of our selves as surface-dwellers, the artificial division — the environmental, affective, and psychic caesura — developed. Yet as Rosalind Williams evocatively reminds us, the “real surface of our planet is the upper edge of the atmosphere, beyond which lies the frigid and uninhabitable realm of outer space. We have always lived below the surface, beneath the atmospheric ocean, in a closed, sealed, finite environment, where everything is recycled and everything is limited.”26 The language Williams uses to describe the weathered world — the atmospheric ocean — echoes Flammarion, who explained the invisible yet omnipresent atmosphere in terms of its fluidity. If, as Williams argues, we have always been beneath an uppermost boundary yet atop another level plotted along a vertical axis, are we not in a permanently liminal state?
Such a reading counters what Peter Sloterdijk proposes in Bubbles when he suggests that the shift in our understanding of the solar system forced the realization that we “would exist for all eternity only on a ball, but no longer inside a ball.”27 We are neither, as the atmosphere is not a ball but an envelope that shrouds the planet. It is in occupying the shell — or, for Sloterdijk, in burrowing deep within a ball — that we create meaning in the face of a seemingly endless immersive state, as if the threat of interchange with a surrounding medium were a slow form of dissolution.

It is useful here, in closing, to return once more to Flammarion’s treatise on the atmosphere, where the author describes the earth’s position relative to the entire universe by comparing our planet’s course around the sun to the course of a lead weight dropped into a bottomless abyss. After thousands of years, the weight would have travelled a great distance — and yet this distance would be nothing at all, as it is relative to an infinite space and becomes, as a result, equivalent to stasis.28 Still, we are reassured that our own smallness is not insignificant. After all, the atmosphere is in everything, becomes everyone, and recuperates all that it contains: everything is involved in the cycle “between the products of nature and the moving flood of the atmosphere.”29,30 We are within it as much as it is in our own bodies; faith in membranes only ever produces temporary relief at the cost of splitting our selves from the beings that are equally immersed. We are all, then, mobilis in mobile. Entering into a communion with the atmosphere allows for an affective opening that binds human bodies to our external environment and incorporates us within natural cycles.

This shift bears significant ecological repercussions. The atmosphere as fluid transforms the air into a sea of currents; that which is invisible no longer connotes emptiness, but rather becomes a force that absorbs all output and redistributes it across an all-encompassing system. Greater awareness of our place within this fluid world transforms our very surroundings from spaces that can be filled with the by-products of human activity to a delicate, reverberating network. This ür-presence is what distinguishes the nineteenth century’s explanation of the atmosphere from our current understanding of the air as a gas, which transforms the atmosphere into a substance that surrounds bodies but also remains separate from them. Steven Connor describes our current condition as being surrounded by air “as you would be surrounded by a room or a house. But you are not yet, nor ever will be, on the inside of air. In the air, you are only ever out.”31 If the atmosphere is a fluid, however — and one that fills in all of the tiny gaps between its own atoms, rendering interstices obsolete — it is within our bodies as much as it is without them. The flow of currents envelops everyone and everything, but everyone and everything also contributes to the atmosphere’s sweeping expansion by adding their own effluvia (be it breathy or otherwise) to the bottomless aerial ocean.

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NOTES

2. The British Almanac of the Society for the Diffusion of Useful Knowledge for the Year 1830 (London: Published by Charles Knight, 1830), 68.
6. Camille Flammarion, The Atmosphere, trans. CB Pitman, ed. James Glaisher (London: Sampson Low and Company, 1873), 5. Emphasis added. The Preface to the first edition, slightly modified over time, declares: “The science of the Atmosphere is the question of the day. We are just now, in regard to this study, in an analogous situation to that of modern Astronomy in the days of
Kepler. Astronomy was founded in the seventeenth century. Meteorology will be the work of the nineteenth," 6. As the century progressed and meteorology findings fell short of meeting Flammarion’s high expectations, this passage was redacted.


10. William Butcher’s notes on the Nautilus’s famous motto specify that in Latin, *mobilis* means “nimble, mobile, lively; shifting, varying, changeable; inconstant, or fickle’ and thus *mobilis in mobile* can be translated as ‘mobile in the mobile element’ or ‘Changing within change.’” In Jules Verne, Twenty Thousand Leagues Under the Seas, p. 392-393.

11. See chapter XI, « Le Nautilus ».


19. « Pendant plusieurs heures, le Nautilus trancha de son éperon ces flots blanchâtres, et je remarquai qu’il glissait sans bruit sur cette eau savonneuse, comme s’il eût flotté dans ces remous d’écume que les courants et les contre-courants des baies laissaient quelquefois entre eux.

Vers minuit, la mer reprit subitement sa teinte ordinaire, mais derrière nous, jusqu’aux limites de l’horizon, le ciel, réfléchissant la blancheur des flots, semblait longtemps imprégné des vagues lueurs d’une aurore boréale. » Jules Verne, Vingt mille lieues, p. 301-302.


21. « La lumière, qui éclairait le sol jusqu’à trente pieds au-dessous de la surface de l’Océan, m’étonna par sa puissance. Les rayons solaires traversaient aisément cette masse aqueuse et en dissipaient la coloration. Je distinguais nettement les objets à une distance de cent mètres. Au-


24. Camille Flammarion, *The Atmosphere*

25. Ibid., p. 5.


28. This passage can be found in the French edition of *L’atmosphère*, p. 19-20.


30. « entre les produits de la nature et les flots mobiles de l’Atmosphère ». Camille Flammarion, *L’Atmosphère*, p. 27


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**Abstracts**

This paper explores different perceptions of the atmosphere and their concomitant influence on literary expression in the nineteenth century. It stems from an ongoing examination of the atmosphere as something that signifies an environment, a substance, and an emotional tone. It proposes that while the nineteenth century’s western European understanding of the atmosphere as a fluid, inherited from eighteenth-century early natural philosophy and buttressed by the rise of meteorological studies, is something scholars no longer consider when reading the period’s cultural texts, it is as important as the early modern period’s flat earth — and instrumental when considering the era’s burgeoning environmental concerns. Through a series of close readings of Jules Verne’s *Vingt Mille Lieues sous les mers*, I examine how a fluid atmosphere highlights humanity’s state as a species that must live in the middle (rather than above, or below). Yet the perpetual state of being in between, crystallized by Captain Nemo and Dr. Aronnax, is profoundly uncomfortable. It spurs the creation of protective membranes that perpetuate the illusion of containment. In turn, the artificial separation from the experience of immersion in a liquid atmosphere provokes a radical caesura — humans no longer perceive themselves as fundamentally connected to their surroundings.

Cet article considère l’atmosphère en tant que concept scientifique qui influença l’expression littéraire du dix-neuvième siècle. L’atmosphère, en tant qu’environnement, substance, ou ton affectif, s’infiltre dans les textes que nous lisons sans pour autant se faire remarquer. Au cours du dix-neuvième siècle, l’atmosphère était perçue comme étant un liquide — une idée héritée du dix-huitième siècle et de ses théories proto-scientifiques, ainsi que du développement de la météorologie en tant que discipline indépendante — mais cette perspective est oubliée de nos
jours, bien qu'elle soit importante, et ce, surtout quand nous considérons les craintes environnementales naissantes de l'époque. À travers une série de lectures détaillées du roman *Vingt Mille Lieues sous les mers*, de Jules Verne, cet article considère comment l'atmosphère, conçue en tant que liquide, souligne l'emplacement spatial de la race humaine comme étant au milieu d'une série de couches. L'état d'intermédiaire, ainsi représenté par le Capitaine Nemo et le Docteur Aronnax, est profondément indésirable. Il provoque la création de membranes protectives qui, à leur tour, renforcent l'illusion d'une séparation parfaite entre le corps et son environnement. Or, cette séparation, fondamentalement artificielle, nie l'expérience d'une immersion totale promise auparavant par l'atmosphère liquide. Résultat : les humains ne se perçoivent plus comme faisant partie de leur environnement et se croient séparés par une division imperméable.

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