

*II. A means of locomotion for the void.
Volfrang leaves Earth for a better world.
The atmosphere. Inania regna.*

“The inhabitants of Venus,” said Volfrang, “are taller in stature and more lively in temperament than those of our planet...”

“Oh-oh!” Leo interjected. “Here you are, already transported to that world. First explain to us how you got there. Was it like Cyrano de Bergerac, or Hans Pfaall, going to the Moon?”

“I didn’t employ either of the means that they adopted. Cyrano couldn’t go very far with bottles filled with water vaporized by the Sun’s heat, because the vapor, acting equally on all the walls of the flasks, couldn’t impart any upward movement to them, and all that would have been possible was to make them explode. Hans Pfaall was scarcely better inspired in lifting himself by means of a balloon, which would necessarily leave him part-way, a little above the clouds, in the region of the atmosphere in which the air, increasing rarefied, is no heavier than hydrogen. Even supposing that the bottles or the balloon had carried them into the void, what is perfectly certain is that they had no means of steering. I had, therefore, a double problem to solve.”

“And how did you do it?” asked Leo.

“You know that the general system of locomotion on our globe, for all creatures and vehicles alike, is founded on the theory of the lever; they move by exerting an effort on a point of support. That point of support is the ground for people and animals that walk or crawl, water for fish, and air for birds. As for our steam-powered vehicles, the point of support is the rail on which the locomotive’s wheel weighs and acts. What has prevented us, until now, from steering balloons is, I believe, that we’ve never got past the principle of the lever, and that the atmosphere, especially in its upper layers, is too thin to furnish a sufficiently resistant point of support, with regard to the mass to be moved.

“There exists, however, one motor that does not borrow any force from its surrounding medium—that which is founded on the difference of pressures acting on the interior walls of a body, the effects of which you must frequently have observed in the atmosphere.”

“Bah!”

“Undoubtedly. How many times have you seen objects rise into the air, not like a balloon, by reason of relative lightness, but by virtue of an interior impulsion: those explosive signs of popular joy that shine in every celebration in every land, for all governments, flying rockets?”

“Indeed,” said Muller. “They launch themselves like fiery arrows into the black profundities of the sky, because of the pressure of the gas produced by the combustion of gunpowder. That pressure acts on all the walls, but, as it’s naturally stronger on the wall where the orifice is located, the result is, the equilibrium being broken, it acts on the one opposite that orifice and draws the rocket into a rapid movement of recoil.”

And that movement,” added Volfrang, “is so far from being based, like that of birds, on the resistance of the air, that the resistance in question opposes it instead of assisting it. If the combustion of the powder could take place in the void, the rocket would rise up therein with even more thrust and rapidity than our fireworks.

“It was in accordance with these givens that I constructed my vehicle to pay a visit to that splendid star, our neighbor, which we call by the gentle name of Venus.

“My apparatus consisted of a rectangular reservoir with a surface area of about four square meters and a height of a meter, to the superior wall of which was attached the nozzle of a pneumatic pump driven by powerful electromagnets. At each of its corners was a sort of truncated cone, which could move in every direction, and through the orifice of which water, with which the reservoir was filled by means of the pump, was expelled, after having passed through a vertical pipe to increase the pressure.

“Obviously, when the pump was activated, because the water compressed all the walls of the cone save for the one from which it had emerged, the cone was necessarily pushed backwards, pulling the reservoir, with a force equal to the pressure that the liquid had exerted on the portion removed to make the orifice.”

“Permit me to observe,” said Leo, “that such a machine must expend a very large quantity of water.”

“The water wasn’t lost, for the jet was interrupted and deflected a certain distance away by a little paddle-wheel, which caused it to fall into a basin, in order to be extracted again by the pump.

“It was on this vehicle that I departed.

“My first concern had to be to extract myself, as soon as possible, from terrestrial attraction. Directing my jets toward the ground, I set off, climbing vertically. The initial movement was rather slow, like that of a train pulling away, but as the continuous impulsion I was imparting to the machine added to the velocity acquired, the ascent became very rapid.

“How can I describe the marvelous panorama that extended beneath my feet, whose vast horizon increased incessantly? From one moment to the next, at the extremity of a great plain whose undulations escaped my gaze, I saw a chain of mountains rise up, and other mountains behind them in their turn. Here and there, streams and rivers snaked, extending the meanders of their silvery coils to infinity. You can imagine how gripped by admiration I must have been, confronted with the grandiose beauty of such a spectacle!

“Meanwhile, the plain over which I found myself became gradually narrower, invaded by the mountains that surged incessantly over the horizon. Soon, my gaze could no longer make out their summits, which appeared me as the motionless waves of a sea of verdure, over which shone, to the south and the east, the Alps of Switzerland and the Tyrol, like the silvery wakes that fleecy waves make on the ocean as they break into long trails of foam.

“As I was absorbed in the ecstasy of my contemplations, my aerial skiff was tormented by a southerly wind, which became rather violent, bringing with it the cohort of large clouds that forms its usual cortege. Those clouds gathered into profound black masses, as if to deliver battle to the Earth—and, indeed, dull and menacing noises were soon rumbling in their flanks. A bolt of lightning, which they launched at one of the highest mountains as if at a defensive fortress, opened the attack, and immediately afterwards they sent forth a frightful volley of icy bullets, which ravaged the vines and crops mercilessly.

“As you can imagine, it was not without a keen apprehension that I penetrated into the very heart of the tempest. As soon as I reached the first layer of cloud, I found myself in profound darkness. Fiery vapor, like thick oily smoke, surrounded me—except that, from time to time, lightning flashes projected a sinister red light upon it, creating the *darkness visible* that Milton placed in his inferno. Rapid as my ascent was, I travelled through those caliginous masses for much longer than I would have expected. They seemed to me to be at least five leagues thick, like the cloud that Messieurs Barral and Bixio traversed in their aerostatic voyage,¹ and I experienced great satisfaction when a glow, initially feeble and confused but becoming increasingly sensible, finally penetrated the opacity of the fog. As I had then reached the most elevated layers of the atmosphere, the cold became extremely sharp, dropping below 30 degrees Fahrenheit, condensing the vapor into icy droplets—which, falling through the thick cloud-layer, freezing more vapor around them, thus attained the usual size of hailstones.

“As I approached the extremity of the cloud, I saw the Sun outlined as a ruddy globe, like a lump of coal brought out of a furnace, as we perceive it through the morning mist—except that, by virtue of a curious mirage effect, its image was reflected below me in the vapor. Gradually, it recovered its radiant crown and I found myself in an atmosphere resplendent with light.

“The azure gleam of the sky, which I was very happy to see again, was, however, dull and pale compared with the mass of vapor that I had just traversed. You can barely imagine the snowy splendor of clouds in their upper surface. As we generally see them between the Sun and ourselves, they hardly ever present to us any but their darker face; the other only appears to us in profile, garlanding the nebulous masses with those brilliant contours that the paintbrush cannot reproduce. Seen from the skyward direction, the cease to be screens in order to become reflectors, and from the viewpoint I occupied, there was nothing to compared with the dazzling glare of the same cloud that spread darkness and desolation over the Earth.

¹ After a surge of interest in the late 18th century, the use of balloons in scientific research was virtually abandoned in the first half of the 19th. A widely-publicized attempt to revive such research was made in the summer of 1850, when Jean-Augustin Barral (1819-1884) and Jacques-Alexandre Bixio (1808-1865) undertook two ascents in a hydrogen balloon from the Paris Observatoire; the first nearly ended in disaster but the second took them up to 20,000 feet and allowed them to make some significant meteorological observations.

“As I rose up, the clouds, by virtue of a natural illusion that the empty space surrounding me rendered more deceptive, appeared to descend, as if their weight had suddenly increased and was dragging them down in a rapid fall. The wind soon swept them away, though, allowing me to see the ground again.

“For a man accustomed, as we are, to crawl upon our globe within the narrow and paltry circle of our affairs, the distant panorama and the immense azure cupola that crowned it was, I assure you, an imposing and sublime spectacle. There was one moment when it became marvelous in its grandeur and beauty: that was when the Sun, having disappeared over the terrestrial horizon, left the landscape in shadow and illuminated the light mists floating in the lowest atmospheric layers with the rich colors of its setting. That was a truly magical splendor! Above my head, the zenith forming a black dome dotted with a few stars, then the spherical concavity of the sky, passing, in successive zones, through ever brighter and more vivid shades to catch fire with purple and orange tints, terminating in the background in a profusion of dazzling yellow, strewn with long black clouds like fantastic islands in an ocean of molten gold.

“If my soul dilated ecstatically before this magnificence, my body, in compensation, suffered rather cruelly from the conditions in which a hitherto-unexplored elevation placed it. I could scarcely breathe, and shivered in the grip of cold. I was obliged to think about generating air and heat.”

“By what means?” asked Muller.

“You can take it for granted, my dear chap, that one does not undertake a voyage like the one to Venus, without making provisions. As air and heat were bound to be lacking in the void, I had taken care to equip myself in that regard. For that, I had made myself a sort of thick crystal cage, in which I was able to manufacture oxygen and nitrogen chemically. That partition descended as far as the basin designed to receive the water from the truncated cones, for, in planning a voyage outside the atmosphere, I had to guard against the evaporation that the void could not fail to produce.”

“And to protect yourself from the cold, you had also installed a fireplace?” Leo suggested.

“No, certainly not. The process of combustion would have devoured my laboratory atmosphere in the blink of an eye. Instead of a fireplace, I had placed a box full of quicklime on top of my water reservoir; I moistened it, and the reaction produced generated a gentle heat that accumulated in my little crystal palace.”

“Why did you place it on top of your reservoir?” Muller asked.

“To prevent the water from freezing.”

“You know,” said Leo, “your machine, furnished with all its accessories, must have been rather heavy?”

“Of course—but it was powered proportionately. As its force was in direct proportion to the size of the orifices and the pressure exerted on the water, I was able to increase it at will.

“As I rose up further, the black starry cupola rounded overhead took on ever-greater dimensions. When it had grown sufficiently to form a complete hemisphere, I passed beyond the limit of the atmosphere and entered the kingdom of the void, *per inania regna!*²

“Seen through a double convexity of the atmosphere and an extent of vapor twice as long as that which separates us from the horizon, the Sun appeared much larger and fainter than when we watch it set from any point on the terrestrial surface. It offered the appearance on an enormous dark red disk, which, at times, was animated by brighter gleams, according to the vicissitudes of transparency experienced by the air. Soon, I saw it disappear behind the distant curve of the theoretical horizon; its ardent gleams were gradually extinguished and the black clouds that I had seen silhouetted against a background of light lost the clarity of their contours—or, rather, seemed to spread out and completely veil that part of the sky. Nothing remained but a faint red glow, which faded away in its turn.

“I entered into the cone of the Earth’s shadow.

“A spectacle no less sublime was then offered to my eyes. Above that sphere, resplendent with the rich colors of the rainbow, which I had just been admiring, I found another, all sparkling with stars. You can’t imagine how bright their fire was. Certainly, on the ground, from the summits of mountains, we have often admired the scintillating radiance of constellations—but the atmosphere, mingled with vapors, dulls their glow, which is also muted by the bluish background of the sky that they still

² “In the realm of shadows.” The phrase, taken from Book VI of Virgil’s *Aeneid*, became a popular Latin citation in France.

illuminate slightly. Then again, one can only distinguish clearly those that are situated in the region of the zenith, the others being veiled by a more extensive and mistier layer of air. In the bosom of the absolute void that I had reached, however, millions of stars are as resplendent on the horizon as at the zenith, nothing being able to weaken the vivacity of their radiation. It seemed to me that I was floating in the midst of a profusion of diamonds, a celestial dust swirling in infinite space. Only below did the Earth round out its opaque disk, forming a circular screen upon the starry splendor of the sky. Here and there, on its darkness-drowned surface, the distant gleams of the artificial lighting of great cities appeared as red dots.

“A profound, universal silence, unusual to the human ear, reigned around me. On our globe, even on the calmest nights in the most deserted locations, there is always some noise to make activity and life manifest: the heavy flight of a nocturnal bird, the rustle of foliage, the babbling of a brook, the distant voice of a river, and so much more. But there, not a quiver, not the faintest echo of the slightest murmur...a bleak, absolute silence, as immense as its solitudes, the implacable persistence of which chilled my soul with a sinister terror.

“O noises of the Earth, cherished and customary noises, what had become of you? Tumultuous rumblings of large populations and huge waves, joyous birdsong in the countryside, long plaints of winds in sheer gorges or profound forests, soft and savage harmonies of creation, to which our ear only pays distracted heed, accustomed to them as it is, how I suffered room no longer hearing you—and in that vast silence, that profound darkness, that corrosive cold, I felt that I had strayed into the domain of Death! The sentiment of such solitude in the midst of nothingness overwhelmed me with a profound prostration, as if to punish me for the audacious sacrilege that had caused me to go beyond the limits assigned by God to every living being.

“It was at that point when, seized by nostalgia, I wanted momentarily to renounce my extraterrestrial voyage and return to our planet—but as the fabulist says, ‘the desire to see and the unquiet mind/finally getting the upper hand’³ I continued on my way... a poor Robinson Crusoe of the immensity!”

³ This fragmentary couplet is from Jean de La Fontaine’s verse fable “Les Deux pigeons” [The Two Pigeons]. It may be relevant to note that the venturesome pigeon’s exploratory voyage does not end well in the fable.