

JOURNEY TO THE LAND OF THE FOURTH DIMENSION

I. *The Silent Soul*

Having arrived in the land of the fourth dimension some time ago, I find it strangely awkward, as I begin to write my anticipated memoirs, to translate them into ordinary language—the vocabulary of which is, of course, conceived according to the givens of three-dimensional space.

No words exist capable of defining precisely the bizarre impressions that one senses when one elevates oneself permanently above the world of habitual sensations. The vision of the fourth dimension reveals entirely new horizons to us. It completes our comprehension of the world; it permits the realization of a definitive synthesis of our items of knowledge; it justifies all of them, even though they seem contradictory, and one understands that it confers a totality upon ideas which partial expressions cannot contain. The fact of enunciating an idea by means of words in common usage limits one to the preliminary assumption of three-dimensional space. Now, although we know that the three geometrical dimensions—length, breadth and height¹—can always be contained in an idea, those three dimensions, by contrast, can never suffice wholly to construct a quality, be it a curve in space or a reasoning of the mind. Neither numbers nor words constructed in three dimensions can take account of that difference between the container and the contained, between idea and matter, between art and science, which is not measurable in quantities—and which, for want of a better term, we call the *fourth dimension*.

It is not at all astonishing that, taking the part for the whole, I should use the words *fourth dimension* in the course of this story to describe the continuous ensemble of phenomena, incorporating into that ensemble what it is convenient to call “the three dimensions of Euclidean geometry”. In spite of its imperfect name, one should not, in fact, consider the fourth dimension as a fourth measurement added to three others, but rather as a Platonic fashion of understanding the universe,² without there being any need for him to dissent from Aristotle on this point: as a means of escape, permitting the comprehension of things in their eternal and immutable aspect, and a liberation from modification of quantity in order to attain the quality of facts.

I know that I could, in writing these notes, have recourse—as some philosophers do—to a conventional vocabulary, coining obscure words to mask the insufficiency of current language, but that would only serve to push the difficulty back without resolving it. I therefore prefer to recount these memories of my journeys in the land of the fourth dimension in the ways they presented themselves to my mind, without literary pretension, naively and in disorder, hoping for the reader’s indulgence, and will be happy if I can merely evoke in his mind a few dormant ideas that no one, in our world, has yet bothered to awaken.

To begin with, in spite of the difficulties of vocabulary, and especially the impossibility of my classifying chronologically future memories that escape any notion of time, I shall attempt to retrace the mental path which, little by little and step by step, led me to the land of the fourth dimension.

Before anything else, it is necessary to establish that the process of being transposed—”transported” is the wrong word—to the land of the fourth dimension immediately overturns the common notions we have of time and space. Naturally, therefore, it is by means of small observations contradicting these common notions that the attention is gradually attracted to the possibility of the great voyage that our mind may accomplish. These contradictions are frequent, in everyday life as well as in the opportunities of the loftiest scientific research.

Because presentiments make us afraid when they come true, we prefer to explain the leaps of our heart in terms of passionate causes rather than the obscure aspirations of the race, and, when we speak of the exact

¹ Pawlowsky has “*largeur, hauteur et profondeur*” [breath, height and depth], using “*profondeur*” as a painter might, to refer to a horizontal rather than a vertical dimension; I have made the substitution in the interests of conserving clarity.

² Plato argued that the true objects of knowledge are not located in the world of sensory experience but in a world of Ideas or Forms that must lie beyond it, of which sensory phenomena are only a sort of distillate or shadow. He suggested that the disembodied soul might have direct knowledge of the Ideas and that the process by which the incarnate soul increases its knowledge is one of *anamnesis* [recollection], in which information is gradually and effortfully recovered from some kind of subconscious reservoir. Pawlowski’s narrator, in learning to perceive the fourth dimension, is, in effect, amplifying the process of anamnesis in order to gain access to this subconscious reservoir, and hence the world of Ideas. This kind of Idealism is contradicted by Materialism, which asserts that nothing exists but matter in motion and that knowledge can only consist of discovering associations between observed phenomena—the fundamental assumption on which the scientific method is based.

sciences, we avoid as subversive all indiscreet questions regarding the impossibility of explaining a curved line, parallelism, movement and, in general, everything that surrounds us.

Time without the space that expresses it is inaccessible to us, and space can only be explained to our senses in terms of the time we take to traverse it. By virtue of a sort of natural slothfulness, however, our mind avoids and dissimulates these contradictions, as if they constituted a veritable mortal danger.

In fact, it is necessary to recognize that, in the present state of our civilization, few minds can support without danger the abrupt destruction, or even the dissociation, of notions of time and space. These notions are so indispensable to us that we immediately feel terror and madness brushing our minds when we relieve ourselves momentarily of these two traditional crutches, which allow us to take our initial steps safely.

We feel, however, that we are perpetually surrounded by an immense unknown. *We* occupy a strange and ill-defined location *between* the sensible world and our consciousness; we remain timidly curled up in the depths of a ship that carries us wherever the waves of an unknown sea dictate, and we declare ourselves satisfied if our location remains subjectively much the same, between the four walls of our cabin. If, however, we were to take it into our heads to emerge briefly from our retreat and courageously direct our eyes outside, it would be easy to understand that nothing is less safe than our perilous situation in the ensemble of phenomena and ideas.

Could there be anything more uncertain, in fact, than the notion of time that appears to us to be fundamental? Certain undeniable facts of psychic notification, of future prediction, would be worthy of being courageously envisaged by science, if science were not terrified by the idea of emerging momentarily from its petty domain of known relationships, in which ideas are formulated like the steps of a minuet. We accept historical knowledge of the past as something perfectly natural, but is it not evident that the past, of which we are so sure, does not presently exist, and that nothing, in consequence, can permit us to prove its existence? We use, as a basis for that proof, objects that subsist and personal memories, although we know perfectly well that this material evidence and these intellectual memories are, in the final analysis, only present vibrations.

The future seems to us unknown, because we believe that we have no material vision of it. This is, however, a crude and superficial reasoning that is limited in its range once we understand that the world as it appears to us is only luminous because we have eyes, sonorous because we have ears, and solid because we can touch it—that it is only formed, in reality, of different, obscure and mute vibrations, immaterial in the absolute sense of the word. The past is made of nothing but present vibrations; why, I ask you, could the future, which is contained in those same vibrations, not be known in a fashion just as certain, if we had a true understanding of the totality of motion,³ in accordance with which the entire universe would be seemingly modified for our sensibility?

When one has arrived in the land of the fourth dimension, when one is liberated forever from the notions of space and time, it is with this intelligence that one thinks and reflects. By virtue of that, one finds oneself confounded with the entire universe, with pretended past events. Everything, henceforth, is a world of forms and immobile and innumerable qualities, which are, in a way, merely the harmonious lines of the same masterpiece.

One can, of course, discern in this world, as in everyday life, different points of existence and link up events that connect them, but it is useless, for that purpose, to appeal to the habitual notion of time. Events are outlined in the manner of geometrical figures—or, better still, the contours of a marble statue. Nothing can have, properly speaking, a beginning or an end. Nothing subsists any longer but harmonious symbols. One understands then how poor and inexpressive words such as *Journey to the Land of the Fourth Dimension* are. In this intellectually superior state, *journey* signifies nothing, and the expression *fourth dimension* itself is nothing but the manifestation of a synthetic state rather than the analysis of a new quality.

As soon as one has arrived in this world of pure ideas, every expression of ordinary language becomes negative. The mind no longer operates with anything but the universality of things; its ideas are all possible, without any possible reaction. *The silent soul* is no longer disturbed by the noises of the world; they are no longer anything but conventional points, incapable of embracing the immortal unknown idea of the mundane, and confusing all eyes with that mysterious veil we call time.

These general notions of the relative existence of time were not, however, those which first appeared to me most clearly. I only understood the whole of their strange scope when, having already arrived in the land of the fourth dimension, I was able to know simultaneously what had happened in ages past and what would happen in centuries to come. The overturning of the habitual idea that one has of space, the abstraction of distances that I succeeded in realizing progressively, the discovery I made of the Flat House with two exits, and the fashion in which I traversed the Horizontal Staircase, permitted me for the first time conclusively to abandon our three-dimensional world and to travel in all tranquility into the unknown.

³ The mathematician and philosopher Pierre Laplace suggested that a “daemon” which had full cognizance of the present position and directional velocity of every particle in the universe would be able to extrapolate the entire past and future from those data.

II. The Untied Ribbon

The first obstacle that one encounters, when one first ventures into the land of the fourth dimension, is the ancestral resistance of the body, conceived in three dimensions. The mind adapts itself quite naturally to the abstractions of space and time, but the body seems, at first, to be incapable of escaping apparent material necessity. Curiously, however, the first facts that pointed out the road to the fourth dimension for me were purely material. They demonstrated to me, with adequate evidence, how close we are, without being aware of it, to the conception of the fourth dimension—which, for a long time, has justly preoccupied all those who have devoted themselves to the study of transcendental geometry.

I knew that an attempt had already been made to take account of the curious abilities of a medium, explaining them by the existence of the fourth dimension. This medium tied genuine bow-knots in an extended cord whose extremities were held by trustworthy individuals. I knew, too, that it had been explained that the theorems of Lobatchevsky, Riemann, Helmholtz and Beltrami are the sole logical bases of any true theory of parallelism.⁴ I did not, however, have the opportunity to establish for myself the possibility of similar experimental demonstrations until the day when, desirous of conserving a few letters that I had, I decided to tie a ribbon around a little box—which, I was told, had come from India. Once the knot was tied, I remembered that I had forgotten to place one letter in the box and, instinctively, while thinking about something else, I opened the box, put the letter in, and closed it again.

Only then did I notice that I had forgotten to untie the knot.

I reviewed the facts carefully, and was forced to admit, by virtue of the wax seal, that the knot I had made and which absolutely prevented the opening of the box, had not been touched. The object undeniably avoided the ordinary rules of our three-dimensional space.

I remembered then that Félix Klein had demonstrated that knots cannot subsist in a four-dimensional space and I understood that the box I had before my eyes had been constructed outside any Euclidean law—that the curious object must have been conceived in India and materialized in France without the necessity to transport it materially.

Needless to say, after that extraordinary adventure I sought by every possible means to find a rational explanation for it. I had doubtless been the victim of a simple hallucination, and there was nothing to prove that the stray letter was actually inside. I opened the box again, this time untying the ligature. The letter was indeed there! Perhaps I had put it there before the first closure? But a little bit of wax had fallen on the forgotten envelope when I closed the box for the first time, providing indubitable confirmation of my memory. Materially, the fact was impossible to admit. Materially, however, I was obliged to concede its reality. I confess that the certainty was, at first, infinitely painful for me, for it overturned the fundamental notions without which our mind goes astray and is set adrift.

Nothing is easier to accept, in fact, than the existence of unknown and invisible forces situated inside us, which can be externalized to provoke phenomena that are only surprising in appearance. Everything can thus be explained with the utmost simplicity. In haunted houses, for example, we always find some unbalanced young woman in the neighborhood, whose nervous force, unwittingly externalized, is sufficient to produce the strangest phenomena. From there to thinking that there are unutilized forces dormant within us, more powerful than all the machines in the world, is only a single step. A day will come when we shall understand that there exists within every human being a path of progress much surer and much easier than the external path that science is presently attempting to follow.

It is necessary to say, though, that all these phenomena, still mysterious because they are unknown, do not overturn anything in our habitual vision of the world. No one doubts that there are fluids other than electricity, but that never upsets the notion of cause-and-effect that forms the basis of our reasoning, and it is only when the relationship of succession seems to us to be inverted that our reason totters.

What mysterious intervention had been able to overturn the relationship of succession in the events of which I have conserved such a precise memory? I could not account for it in a plausible fashion at first, because it proved impossible to repeat the adventure as I wished. My traditional attention had been awakened; it was always necessary for me to untie the ligature to open the box.

⁴ The references here are to three of the mathematicians who made key contributions to the development of non-Euclidean geometry in the 19th century, Nikolai Lobatchevsky, Bernhard Riemann and Eugenio Beltrami, plus one of the first physicists to recruit their work to the explanation of actual phenomena, Hermann von Helmholtz. A fourth mathematician involved in that development, Félix Klein, is cited further down the page. Euclid had previously analyzed the foundations of geometry as a series of five postulates, the fifth of which was the “principle of parallelism”, which states that a point displaced from a line can have only one line drawn through it parallel to the first; the first non-Euclidean geometries were derived by varying this postulate so that there is (in Lobatchevsky’s version) more than one possible parallel line or (in Riemann’s version) none at all.

I thought it, therefore, prudent not to advertise such an absurd incident—but I conserved the memory that had impressed me vividly. It was, for me, the first certain indication of the existence of a four-dimensional space in which *a ligature could not subsist, nor a locked room remain closed*, but I only understood much later how our traditional ideas of succession in time could be modified, and how that succession might become void on the day when, thanks to the intervention of the fourth dimension, all facts become, in a sense, simultaneous: detached from any historical relationship of cause and effect, distinguished from one another only by their qualities.

III. The Innumerable Diligence

Some time after the adventure of the Hindu box, the existence of the fourth dimension was revealed to me in a more precise fashion by some observations that I made concerning the possible abstraction of distances.

I have always been somewhat distrustful of spiritual experiments, particularly reported legends of Asia. It is necessary to recognize, however, that Orientals often appear to have realized the suppression of space in a practical fashion and that evidence in this regard is abundant. Arabs, as everyone knows, can communicate over very long distances without recourse to the telegraph. De Lesseps witnessed it on the occasion of the concession of the Suez canal,⁵ and it is equally well-known that Hindu ambassadors congratulated the Queen of England in London on a victory that her troops in the Orient were achieving at that moment. Have not trustworthy witnesses similarly reported, with telling details, how a Hindu can appear aboard a vessel that had quit the land several days before, deliver a message and disappear, his presence in India being established immediately afterwards? But these are simple materializations at a distance, which will doubtless obtain rational and scientific explanation one day.

More disturbing and bewildering is the observation that one can achieve a possible abstraction of space solely by an effort of will. Moreover, it must be said, all our contemporary effort has been tending for a long time towards a similar result, and we are already beginning to understand that progress can, in large measure, be realized by continually increasing the speed of our actions.

For a long time, economists have considered the sum total of the capital in circulation within a county as representative of its wealth. That element is, however, insignificant by comparison with the *qualitative* element: the rapidity of labor and traffic. Indeed, whether it is a matter of capital or means of transportation, what it is necessary to obtain, before anything else, is a better return of labor, an increase in speed—and social life is increased three hundred and sixty-five times over when one accomplishes in a single day what our ancestors, with the same amount of capital and the same individual energy, could only realize in a year. It is for that reason that, in certain countries that are highly advanced from an industrial viewpoint—America, for example—special engineers called *speed-merchants*⁶ are only occupied with one thing: indefinitely increasing the speed of work, without any corresponding increase in general expenses (quite the contrary).

To take a commonplace example of this extraordinary transformation, it is sufficient to reflect momentarily on what simple day's journey once amounted to, in a humble diligence.⁷

To increase the services that could be rendered by a postal service thus conceived, it was necessary to multiply fantastically the number of vehicles. On the other hand, merely by perfecting the quality of the traffic, increasing the speed of the old diligence by replacing it with an automobile, it was possible for a single vehicle to cover fifty times the distance in the same day, and the service presumably works fifty times better without any need to increase the number of vehicles.

Now, imagine that speed increased in an infinite fashion, and you will establish logically that, if such an increase in speed were possible, the same single vehicle would end up presenting itself at every stop along its route at every moment of the day. That seems unrealizable in practical terms because our material forces are insufficient and we can only conceive of movement in a three-dimensional space—which is to say, as a succession of situations. On the other hand, as soon as we have a total conception of the four-dimensional universe, that which was hitherto absurd becomes easily realizable, and we understand clearly that the same vehicle can find itself simultaneously in all the different situations at every moment of the day, since speed suppresses time on this occasion.

Our mind, which reasons in a four-dimensional space itself, is not astonished when it performs an analogous operation every day in making an abstraction from various situations and grasping at a single stroke the idea of the route as such, or of absolute speed. If we hesitate to apply these abstractions to the material world, it is because our natural weakness causes us to distinguish and categorize in time that which we call a memory and a present vision. A little reflection will suffice, however, to make us understand that, if our mind had the force necessary to evoke a memory as a whole, it would have as much effective reality as our present vision.

Every day, our four-dimensional mind incites us, in spite of ourselves, to disencumber ourselves of the material obligations of the three-dimensional world. Why do we not do, for our material actions, that which we

⁵ Said Pasha signed the concession authorizing Ferdinand de Lesseps to build the Suez Canal on 30 November 1854.

⁶ Pawlowsky here invents the term *vitessiers*, whose translation I have likewise improvised. He is referring to the organizational principles pioneered by Frederick Winslow Taylor, converted into practice by “time-and-motion” studies. The publication of Taylor’s *Principles of Scientific Management* (1911) caused a considerable stir the year before the *Voyage* appeared.

⁷ A diligence, in this sense, is the type of coach that was employed in France as the principal form of public transportation of both people and mail before the advent of the railways.

do for intellectual reasoning? Why retake a road previously traveled? Why repeat an itinerary whose details we know in advance? It becomes an obsession when one runs the same familiar course every day. Why must we submit to the administrative formality that constrains us to retake the same steps we have already taken, to follow the same routes already traversed, to end up at a point at which we know in advance that we are bound to end up? Is there no new procedure that will permit us to escape this base and material obligation?

Already certain modern thinkers have done justice to the prejudice of the straight line. It has been demonstrated, for example, that in a world in which the size of its inhabitants increases and decreases the nearer they approach its center, the shortest route between two points on the spherical surface is a curved line passing via the equator, not the straight line that pierces a tunnel from one point on the spherical surface to another. Can one not conceive, equally, that in addition to these geometrical conditions of transport from one point to another, there exists a more direct process of abstraction, permitting the emancipation of the body and its abstraction from space, in the same fashion in which the mind acts, moving without physical displacement from one idea to another in four-dimensional space?

This idea was, for me, only a striking suggestion—until the day when, happening to be living in a village, I succeeded, solely by the desire of my mind, in catching the local diligence anywhere I happened to be, at any hour of the day, according to the caprice of my will acting in four-dimensional space. The phenomenon produced itself for me spontaneously, without rational explanation, and it was a long time afterwards that I realized that it was materially realized by what I call, for want of a better term, a transmutation of special atoms.