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D'Alembert: a reconciler of opposites in the Age of Enlightenment

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Abstract: The text aims to introduce D'Alembert and his endeavor to reconcile the prevailing empiricism among the encyclopedists with Descartes' rationalist enterprise. With a geometric mindset, the author of the "Preliminary Discourse" of the Encyclopedia sought to harmonize conflicting forces that were present during the Enlightenment era. In navigating the terrain between rationalism and enlightened empiricism, the author grappled with significant intellectual challenges of his time. While maintaining a critical stance toward the metaphysical tradition, he remained within the intellectual circle of the Philosophes. However, he also sought to preserve the geometric spirit of the grand metaphysical systems of the previous century, leading to a fascinating engagement with the notions surrounding the problem of causality.
Keywords: D'Alembert; Empiricism; Enlightenment; Rationalism; Modern Philosophy; Causality.

In the greater spirit, there is always weakness, And, suppressed in the horror of misfortune, Philosophy yields to nature.

(BOCAGE, Sonnet LXXIII)

When portraying Jean Le Rond D'Alembert as the fervent spokesperson for his theory in the famous "D'Alembert's Dream," Diderot was not merely theatrically setting up a fictional clash between the encyclopedists. As elucidated by Starobinski, "By adopting D'Alembert as his imaginary interlocutor, Diderot represents himself confronting the most formidable opposition he could conceive, for D'Alembert is the quintessential geometer, the intellect that refuses to yield except to duly proven theorems" (STAROBINSKI, 2001, p. 69).

The geometer and author of the "Elements of Philosophy" has always held an ambiguous position in the history of philosophy; even in his own time, the judgments about him appeared overshadowed by unfavorable comparisons with his contemporaries. Let us, for now, consider Grimm's perspective: "D'Alembert lacks the genius of President Montesquieu, the brilliance of Mr. Diderot, the elevated and majestic style of Mr. Buffon, and the simple yet forceful eloquence of Mr. Rousseau" (GRIMM apud PATY, 2005, p. 66). This sentiment persists, to some extent, even in our days, as even Hankins, the author of "D'Alembert Science and the Enlightenment," seemed to contribute to this perception: "D'Alembert did not attain the intellectual stature he aspired to and claimed to possess; nevertheless, his role in the 18th century surpassed the sum of his specific contributions to literature and science" (Op. Cit., p. 1).

Being labeled as a figure of limited brilliance, whose primary merit lies in his circulation among enlightened circles, poses a challenge when interpreting his texts. We cannot consider the author of the "Preliminary Discourse to the Encyclopedia" as merely offering glosses or presenting ideas that were gaining prominence in the Enlightenment without significant contributions of his own, rendering his work almost purely historical. D'Alembert engaged in the debates of his time as a spirit of conciliation, and one of rare occurrence. This spirit of conciliation is evident in the almost ambiguous nature of his positions, which places him in a distinct position between the system and the encyclopedia. Without major reservations, we can assert that his place in Enlightenment philosophy allowed him to touch upon almost all the unique aspects that characterized the thought of that era.

D'Alembert's approach to fundamental aspects of philosophy reveals an almost unpretentious tone. In the matter of causality, a subject he addressed in the *Encyclopedia* entries "Cause" and "Final Causes," his characteristic trait becomes quite apparent. When contemplating the mechanical sciences, he constrained the realm of speculation, not allowing for lofty flights of imagination concerning immaterial causes:

> "It would be desirable for mechanics to openly and boldly admit that we know nothing about motion beyond the motion itself, that is to say, the space covered and the time taken to traverse it; that the metaphysical causes of motion remain unknown; that what we label as causes, even of the primary kind [i.e., causes stemming from impulsion], are not truly causes but rather effects from which other effects ensue" (D'ALEMBERT & DIDEROT, 2015, v. 3, p. 44).

This mode of thinking, which incorporates elements related to experience, aligns harmoniously with a keen sense of observation and mathematical analysis. Even accepted principles of his time, such as "effects are proportional to causes," are refuted due to their deviation from observable phenomena. The geometer posits that anyone affirming this principle can only do so when "either they lack a clear understanding of what they are saying or they simply wish to express that two causes, for instance, are related to each other in the same manner as their effects are" (D'ALEMBERT & DIDEROT, 2015, v. 3, p. 45). The struggle against this principle unfolds within the framework of D'Alembert's steadfast adherence to the observable:

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> Therefore, let us conclude that the principle we have been discussing is not only useless but also detrimental. It appears that without the principle of proportional effects to causes, there would be no dispute about living forces. Everyone agrees on the effects. Why go any further? Instead of seeking clarity, subtleties were pursued, leading to obscurity (D'ALEMBERT & DIDEROT, 2015, v. 3, p. 45).

By rejecting the notion of a metaphysical cause and principles that diverged significantly from the observable, the intention was to disengage from a debate that consumed the efforts of scholars studying motion, making it impractical to establish a method of approaching movements and other physical phenomena that would not succumb to futile speculations. This aspect of his thinking, which does not rely on principles detached from experience, carries characteristics that are closely tied to the relevance of discussion and the feasibility of application: "The horror of a vacuum, for instance, is not only a sterile principle but also absurd" (D'ALEMBERT & DIDEROT, 2015, v. 3, p. 46). D'Alembert's simplicity is that of a man of science who sought to reconcile the advancements of his time with the traditions of rationalist thought. Despite his reservations about metaphysical flights lacking a solid basis in observable phenomena, his conciliatory tone is a defining feature of D'Alembert's thinking and sets him apart within the circles of the Enlightenment.

Voltaire, the epitome of a philosopher, recognized this unique brilliance in his friend, as seen in a letter dated September 2, 1758:

> "My dear philosopher, you intended to visit the Holy Father, yet you remain in Paris. And I, who had absolutely no desire to go to Germany, am returning from there. Upon my arrival, I found your Dynamics. I am reading the 'Preliminary Discourse,' and I continue to admire it. I am sincerely grateful to you. How is the Encyclopedia faring? Is it true that Rousseau has written against you and still insists on the dispute over the article 'Geneva'? [...] Ah, what a century, what a pitiful century! Please answer my questions and value a solitary man who is nostalgic for a few people and a few things, but who will always hold you in high regard and appreciation" (VOLTAIRE, 2011, pp. 198-199).

The man deemed lacking brilliance was regarded by Voltaire, known for his agile prose, as deserving admiration—a judgment that hints at the magnitude of D'Alembert's stature. The correspondence between the author of *Candide* and D'Alembert was extensive and reveals a respect that, under Voltaire's pen, was not only unique but also rare. In this atmosphere of respect and high regard for one of the leading minds of his time, D'Alembert responded to Rousseau's accusations in his "Letter to D'Alembert." The position that the author seemed to reserve for himself becomes evident in his famous response, "Letter to J.-J. Rousseau, Citizen of Geneva." The tone of the letter clearly illustrates the difference between the great authors engaged in a dispute over theatrical performances:

> "I do not intend to precisely answer your letter; rather, I wish to engage in a conversation with you about the subject of your letter and share my reflections, whether they are good or bad. It would be too dangerous to contend against a pen like yours, and my aim is not to write brilliant things but rather to convey truths" (D'ALEMBERT in ROUSSEAU, 2015, p. 190).

It becomes evident that in the face of the luminosity of his contemporaries' writings, D'Alembert chose to pursue his own truth, even if it was simple or unadorned. This truth, it seems, possessed a striking characteristic: a geometric spirit. This aspect is significantly present in his work. As he writes in his "Treatise on Dynamics":

> "For a long time, we have successfully endeavored to establish mathematics as an integral part of the plan we have just outlined: we have joyfully applied algebra to geometry, geometry to mechanics, and any of these three sciences to any other science that they form the basis and foundation of" (D'ALEMBERT, 1758, p. 4).

This geometric inclination brought him peculiarly close to the Cartesian tradition, although he was always aware that this approach had its limitations: "It must be confessed that geometers sometimes overindulge in applying algebra to physics" (D'ALEMBERT & DIDEROT, 2015, v. 1, p. 75).

And it is in this context that he becomes an admirer of Descartes: "Let us respect Descartes, but readily abandon opinions that even he would have opposed a century later" (D'ALEMBERT & DIDEROT, 2015, v. 1, p. 187). Despite being a product of his century, his connection with the author of "Discourse on the Method" did not prevent him from recognizing the greatness of endeavors such as Buffon's "Natural History": "A rival to Plato and Lucretius, he infused into his work, whose fame grows day by day, the nobility and elevated style so fitting for philosophical matters, which, in the writings of the wise, are a reflection of his soul" (D'ALEMBERT & DIDEROT, v. 1, 2015, p. 193).

Without indulging in elevated style, d'Alembert seems to have infused his works with an almost geometric simplicity. In his quest to better understand the nature of things, the geometer shared with his century a skepticism towards aprioristic metaphysical systems. He could not conceive of metaphysics in the same way as Baumgarten, a prominent representative of metaphysics in the 18th century, who defined it as "The science of the first principles of human knowledge" (BAUMGARTEN, 2013, p. 99), or even in the manner of Wolff, Baumgarten's master, who defined it as "The science of being, of the world in general, and of spirits" (WOLFF apud BAUMGARTEN, 2013, p. 99). The enlightened circle of encyclopedists could not support such a worldview, not even in relation to the sciences. In his approach to a worldview that was not bound by this metaphysical tradition, D'Alembert revisited Montaigne's argument:

> Regarding a multitude of matters, philosophy adheres to Montaigne's maxim: divine intelligence has placed a veil before us that we would in vain attempt to tear apart. A sad fate for our intellect and self-love; good fortune for humanity (D'ALEMBERT & DIDEROT, v. 6, 2017, p. 323).

His contribution took on a very distinctive character. The rationalism to which he felt indebted had to take on a different form in his century compared to previous centuries.

Since his debut in the world of letters, in his "Treatise on Dynamics" published in 1743, D'Alembert celebrated the fact that "the certainty of mathematics is an advantage that this science owes primarily to the simplicity of its subject" (D'ALEMBERT, 1743, p. i). He had to navigate the pursuit of simplicity in principles even when dealing with complex questions. As Martine Groult points out, there is "the primacy of a method that consists of starting from what is simple" (1999, p. 267). In his quest to understand the nature of motion, the author of the preliminary discourse in 1758 seemed unable to evade certain issues that Diderot presented as central to the world of sciences. This coincided with "the slow and dramatic process that would culminate in D'Alembert's irreparable loss, as he succumbs to pressures and relinquishes his position [as editor of the Encyclopedia], not without much back-and-forth" (MATTOS, 2015, p. 31).

The Preliminary Discourse of his treatise, which greatly pleased Voltaire, maintains great coherence with what was presented in the text of the same name that preceded the "Systematic Dictionary of the Sciences, Arts, and Crafts." D'Alembert does not seem to have turned a deaf ear to the appeal of his fellow encyclopedist, Diderot, who called for the exhaustion of geometric sciences:

> This science will end where Bernoulli, Euler, Maupertuis, Clairaut, Fontaine, and D'Alembert left it. They will have reached the Pillars of Hercules; no one will go further, and their works will endure in future centuries like the pyramids of Egypt, whose masses filled with hieroglyphics awaken in us a remarkable idea of the power and resources of the people who erected them (DIDEROT, 1967, p. 45).

Faced with such a close opponent, the author of the treatise seems to want to justify his use of mathematics, and particularly geometry, in his conception of the theories of body motion. He does not seem to accept the stagnation to which the sciences, to which he dedicated his life, had succumbed, as described by the author of "Jacques the Fatalist." Moreover, he seems to want to respond to this monumental stagnation when he insists that geometry was the foundation of his speculation in various fields. In his "Treatise on the Motion of Fluids," specifically in the preface to the work, he defends the application and adaptability of this science:

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> This small number of reflections is still insufficient to prove the importance of combining geometry and physics. It is through the path of geometry that we can precisely determine the quantity of a complex effect, depending on another better-known effect. Experience is often confounded by us when comparing the analysis of facts discovered through experience. However, it takes time to admit that the different objects of physics are also susceptible to the application of geometry. Whether the foundational inferences in calculus are few or extensive and illuminating, the geometer derives the greatest advantage from them in deducing knowledge of physics that is more worthy of satisfying the mind (D'ALEMBERT, 1744, p. iv).

As a geometer and someone involved in the controversies of his time, the models of science and philosophy have been objects of study and analysis for D'Alembert since his youth. "Science and philosophy are complementary in delimiting the simple" (GROULT, 1999, p. 246). This philosopher steeped in geometry can be understood as a conciliatory spirit, reconciling the conflicting stances of the 18th century. As a member of the most celebrated circles of philosophers in Enlightenment France and a great correspondent of Voltaire, the author of the "Elements of Philosophy" did not view Descartes as an enemy, unlike other Enlightenment thinkers. He stated, "Descartes, in the mid-17th century, laid the foundations of a new philosophy, which was initially pursued with fury, then embraced with superstition, and now reduced to what is useful and true" (D'ALEMBERT, 1994, p. 3). By seeking what is useful and true in the Cartesian corpus, D'Alembert seems to have positioned himself at the abyss that separated his circle from Descartes' postulates, without reducing himself to a mere continuator of the author of the "Meditations on First Philosophy". Although his work is heavily marked by the thought of Descartes, he himself referred to Descartes as "the strictest and most consistent of philosophers" (D'ALEMBERT & DIDEROT, v. 6, 2017, p. 322).

Another characteristic of D'Alembert's unique stance is his relationship to the systematic inclination of rationalist philosophy. Just like the rationalists, he believed that the simplicity of initial concepts gives efficiency and scope to the sciences. "A definition will be all the clearer the simpler it is" (D'ALEMBERT, 1994, p. 21). However, these concepts should not be confused with axioms. For this rationalist empiricist, principles are "the liveliest properties that observation reveals to us in matter" (D'ALEMBERT, 1994, p. 43). It is through conjecture, not deduction, that we come to know things in the world. This aligns with the empirical mode of dealing with evidence, but D'Alembert's sui generis character places him in a liminal scientific relationship between these two belligerent stances. As he states in his Preliminary Discourse, the reduction of systems, analogous to Descartes, to simple principles:

> Since the object of a science is necessarily determined, the principles applied to that object will be all the more fruitful the fewer they are. This reduction, which makes them easier to grasp, continues the true systematic spirit, which should not be confused with a spirit of system (D'ALEMBERT & DIDEROT, v. 1, 2015, p. 73).

The systematic spirit retains some postulations and operations derived from Cartesianism but relates them to the truths of experience. By replacing Cartesian truths with evidence, the systematic spirit can proceed with the support of rationalist scientific construction without resorting to a spirit of system. The systematic spirit unites knowledge, "composed of different branches, several of which have a common point of convergence" (D'ALEMBERT & DIDEROT, v. 1, 2015, p. 113). However, it is not like the spirit of system that Descartes described philosophy as "a tree, whose roots are metaphysics, the trunk is physics, and the branches that stem from the trunk are all the other sciences, which can be reduced to three main ones: medicine, mechanics, and morals" (DESCARTES, 1999, p. 22).

By combining the prevailing empiricism with a systematic appeal of rationalist origin, albeit weakened, D'Alembert was able to employ means that incorporated elements of both currents into his epistemology. This made his stance the most unique among scientists and *Philosophes*. It is precisely in this line of conciliatory spirit that this author became involved in circles dominated by the most radical empiricism, in order to introduce some traces of the systematic spirit that he had assimilated from Descartes. He seems

to follow a path previously indicated by Voltaire in his "Letters Concerning the English Nation," where he admits that Descartes, with his geometric inclination, could have achieved greater success:

> Geometry was a guide that he himself had somehow formed, and that could have safely led him in physics; however, he abandoned the guide in favor of a spirit of system. From then on, his philosophy was nothing more than a clever and, at most, plausible novel for the ignorant. [...] He pushed his metaphysical errors to the point of claiming that two plus two equals four because God willed it. (...) He was mistaken, but at least with method and a consistent spirit. (...) He taught the people of his time to reason and to use their weapons against himself. If he did not pay with good coin, it is significant that he exposed the false (VOLTAIRE, 1984, pp. 24-25).

What we can perceive is that D'Alembert seems to seek a scientific ideal that, following Voltaire's critique of Cartesianism, found its guide in geometry itself, as suggested in the fourteenth English letter written decades earlier by the quintessential Philosophe. In other words, what he seems to have aimed for as an ideal is the union of geometry with the sayings of Montaigne - geometry may not unveil nature, but it still helps us understand it.

It is within this context that we can relate D'Alembert's work to Descartes' philosophy, in the pursuit of advancing towards what his philosophy possesses that is useful and true, which the encyclopedist celebrates by stating, "The science of nature acquires new riches every day: geometry, by expanding its limits, has extended its light to the parts of physics closest to it; the true system of the world has become known, developed, and perfected" (D'ALEMBERT, 1994, p. 4).

It is in the expansion of the limits of geometry, where "applying geometry to the study [of the bodies around us], or in the attempt to apply it to them, we learn to perceive the advantages and abuses of this application" (D'ALEMBERT, 1994, p. 4), that the sciences seem to grow in terms of application, as the application has progressed from celestial bodies to more ordinary bodies.

Partially agreeing with Descartes' premises, this celebration takes the form of a kind of revival of the geometric model, which cannot be considered as something petrified, for his science. We can consider that it is from the limitation of the scope of geometry that the Enlightenment philosopher declares, "I will take geometry as an example, as it is the most fruitful science in truths - truths that support one another" (D'ALEMBERT, 1994, p. 47). It is in the attempt to mobilize a theory of sciences that does not disarticulate their particular applications that a geometric impulse takes place. As a geometer, it is not about elevating one science above the others, but about maintaining a relationship among previously isolated knowledge. Even in a work like the Encyclopédie, there should be no isolation of knowledge; the editors must "expose, as much as possible, the order and interconnection of human knowledge" (D'ALEMBERT & DIDEROT, v. 1, 2015, p. 47), and this effort leads us to assume another thesis: that "it is easy to see that the sciences and the arts mutually assist one another and, therefore, there is a chain that unites them" (D'ALEMBERT & DIDEROT, v. 1, 2015, p. 47).

In this search for order, the process follows the mold of Cartesian philosophy, as it admits that "there is no science or art with which one cannot, rigorously and with a good dose of logic, instruct even the most limited mind, for there are few whose proportions or rules cannot be reduced to simple notions and arranged in an order" (D'ALEMBERT & DIDEROT, v. 1, 2015, p. 87). The idea of reduction to simple principles, introduced in the Discourse on the Method as follows, "it was not difficult for me to seek those (principles) with which to begin, for I already knew that they should be the simplest and easiest to know" (DESCARTES, 1994, p. 55). The reduction to the Cartesian mode brought this characteristic of the simplicity of principles, but in his theoretical construct, these principles, as shown in the preface to the *Principles of Philosophy,* those from which "knowledge of the things dependent on them can be deduced," are related to first causes: "And for this knowledge [philosophy] to be so [a perfect knowledge of all things that man can know], it is necessary to deduce it from first causes in such a way that, in order

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to obtain it - and this is called philosophizing - one must begin with the investigation of these first causes, that is, of principles" (DESCARTES, 1999, p. 15).

D'Alembert will uphold this precept of reducing all the principles of science to the simplest form: "In fact, the more we reduce the number of principles in a science, the greater its scope becomes" (D'ALEMBERT & DIDEROT, vol. 1, 2015, pp. 71-73). By maintaining the general analogy with mathematical sciences and advocating for a reduction to simple principles, disregarding vast and complicated foundations, the philosopher presents a stark contrast to Diderot's position. He does not fail to celebrate Descartes' endeavor in "the application of algebra to geometry" and, in the face of the philosophical renewal brought about by Descartes, he does not hesitate to express, "Descartes dared to show, to open-minded spirits predisposed to accept it, how to shake off the yoke of scholasticism, of the authority's opinion" (D'ALEMBERT & DIDEROT, vol. 1, 2015, p. 169). In this pursuit of simple principles that do not rely on pre-established authority, the enlightened geometer grants the senses an epistemological centrality unknown to his predecessor.

The manner in which we arrive at these principles is where the significant difference arises between the two. D'Alembert does not see himself in a precarious situation when declaring, "It is to our sensations that we owe all our ideas" (D'ALEMBERT & DIDEROT, vol. 1, 2015, p. 49). Continuing the argument, he states, "The system of innate ideas, alluring in many respects and perhaps more impressive for being less known, still retains some supporters, given the difficulty that truth faces in reclaiming its place" (D'ALEMBERT & DIDEROT, vol. 1, 2015, p. 49). Perhaps this respect points us to the singular aspect of his philosophical writings: a fusion between elements of empiricist philosophy, particularly the initiation of knowledge through sensations, and an organization rooted in Cartesian rationalism.

His epistemological concerns have always occupied his work, as D'Alembert consistently incorporates aspects in this regard in his scientific texts. However, it is in the Encyclopedia that his delineations of metaphysics and epistemology gain sharper contours. While historiography has traditionally distinguished characterizations of the modern scientific method between English empiricists such as Bacon, Newton, and Locke on one side, and the embodiment of rationalism in Descartes and Leibniz, D'Alembert seeks to reconcile the irreconcilable. While he aligns with certain aspects of the insular school, such as substituting deduction with induction, absolute certainty with the probable and useful, and the innate matrix of ideas with the direct impression of the senses, his approach seems unmistakably tied to the Cartesian method in many respects.

In his *Treatise on Dynamics*, we encounter a statement that already indicates how the author sought to reconcile these opposing views:

> "The laws produced by experimentation possess contingent truth, insofar as they appear to emanate from a particular decision of the Supreme Being; on the other hand, if these laws accord with those deduced solely from logic, their truth is necessary. This does not imply that the Creator established two types of laws, but rather that certainty cannot be attained in establishing other laws beyond those resulting from the true existence of matter" (D'Alembert, 1758, p. XXIV).

Contingent laws, according to D'Alembert, are those observed through empirical investigation, which for an empiricist would be the only type of law that exists. However, the geometer acknowledges necessary laws as long as they are established through the uniformity of the order we observe in nature, aligning with those that stem from matter left to itself through means that relate to logic. For D'Alembert, "All logic boils down to a very simple rule: to compare distant objects, we employ many intermediate objects" (D'ALEMBERT, 1994, p. 52). It is through logic that, even in the face of uncertainty when establishing certain laws, we can progress through conjectures because "the art of conjecture is (...) a branch of logic as

essential as the art of demonstration. (...) Nevertheless, the more inherently imperfect the art of conjecture is, the more we require rules to navigate within it" (D'ALEMBERT, 1994, p. 54).

His concern with reaching a rationalization in the science of motion, his quest for the ordering of phenomena and knowledge, his conception of evidence, all serve as the basis for us to consider that the Cartesian roots of the geometer were deeply entrenched, yet divergent from his own approach:

> The mind that only recognizes truth when directly struck by it falls far short of the one that not only knows how to recognize it up close but also anticipates and observes it from a distance in fleeting characters. This is precisely what distinguishes the geometric spirit, applicable to everything, from the purely geometrical spirit, whose talent is confined to a narrow and limited sphere. The only means of advantageously exercising both and making them progress somewhat harmoniously is to not confine their inquiries to objects that are merely demonstrable. Rather, it is to maintain the flexibility of the mind without continuously bending it solely towards lines and calculations, and to temper the austerity of mathematics with less severe studies. Ultimately, it is to become accustomed to effortlessly transitioning from light to twilight (D'ALEMBERT, 1994, p. 54).

Once again, the author's reconciliatory spirit, as evident in this *Essay on the Elements of Philosophy*, becomes apparent. We must not restrict ourselves solely to what is revealed with evident clarity; we must "distinguish the gradations of a faint light" to avoid the error of "seeing only dense darkness where others still discern some clarity" (D'ALEMBERT, 1994, p. 54). If we continue through the *Preliminary Discourse* and closely examine its passages, we will notice that even when it comes to understanding the workings of the human mind, D'Alembert, while adopting a conciliatory stance, incorporates numerous traces of Cartesian philosophy beneath his professed empiricism. After establishing sensations as the source of our knowledge in this opening text of the ultimate work of the French Enlightenment, D'Alembert employs a Cartesian resource to substantiate our knowledge - namely, the very notion of the thinking being. This notion bears certain resemblances to the cogito: "The first thing our sensations teach us, something inseparable from them, is our existence. From this, we conclude that our initial reflective ideas must revolve around ourselves, that is, around this thinking principle that constitutes our nature" (D'ALEMBERT & DIDEROT, vol. 1, 2015, p. 49).

The first condition of our representations thus becomes a form of self-consciousness, closely resembling what Descartes accomplished through his first certainty. This thinking principle is self-referential, and with it, we can progress towards external knowledge. Without elevating this notion to the status of a self-sufficient substance that thinks clearly and distinctly, we are prompted to refrain from contenting ourselves with an idealistic framework.

It is upon this primal condition of thinking consciousness that the first movement towards knowledge, directed at objects external to us, finds its foundation. There is an undeniable resurgence of the rationalist approach, as we depart not from the perception of the world, but from the perception of the self and its rational attributes as the origin of our knowledge. The first piece of knowledge, even when tied to sensations, is the awareness of existence. This Cartesian approach brings to the forefront another crucial aspect: "How does our soul extend beyond itself to ensure the existence of that which is not itself? All men traverse this boundless space, all traverse it rapidly and in the same manner" (D'ALEMBERT, 1994, p. 88). It is more than a mere temporal order, where the first state of consciousness precedes the second on a timeline; it is a formal precedence. The external objects known to us depend on the possibility that the subject has of perceiving itself as a thinking entity. There exists a dependency of the external object on the subject's consciousness of its interaction with objects, for the second step towards knowledge is the awareness "of the existence of external objects, among which our own body must be included, as it is, so to speak, external to us even before we have discerned the nature of the thinking principle within us" (D'ALEMBERT & DIDEROT, vol. 1, 2015, p. 49).

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This does not trap us in idealism, nor does it subject us to absolute solitude. Far from resorting to the artifice of doubt, in the face of this "thinking principle that constitutes our nature" (D'ALEMBERT & DIDEROT, vol. 1, 2015, p. 49), we must now establish a condition for knowledge of what lies outside of us. Since there is no recourse to fundamental doubt in this prospect, the solution does not have to be the rejection of everything external to us, and we will not find ourselves in a situation akin to Descartes at the beginning of his second meditation: "As though suddenly plunged into deep waters, I am so taken aback that I can neither touch the bottom with my feet nor swim to keep myself afloat" (DESCARTES, 1994, p. 124).

Relying on this individual principle, which underlies our entire notion of the world, cannot be established as an end in itself. We must be rescued from this "solitude." If the first knowledge we owe to our sensations is the awareness of our existence, the second must be the existence of objects. The certainty of the first is innate; it does not require further reasoning. However, it only validates our exercise of thought. It is through our relationship with external objects that any scientific knowledge can be validated. While the certainty of the second knowledge is not innate, it comes to us through the perception of the multiplicity, coherence, and constancy of sensations that impose themselves upon us, even if we do not will it.

The question now revolves around the validity of this external world beyond the scope of the subject. It attests that "In fact, since there is no relationship between a sensation and an object that causes it or to which we refer, it does not seem possible to find, through reasoning, a possible passage from one to the other" (D'ALEMBERT & DIDEROT, vol. 1, 2015, p. 51). If we consider the author as an heir to Locke, we encounter a problem, for it is an "instinct, more secure than reason itself, that can force us to bridge such a gap" (D'ALEMBERT & DIDEROT, vol. 1, 2015, p. 51). This deeply ingrained instinct ensures the link between the real and the conceptual. In his Elements of Philosophy, D'Alembert further clarifies this point: "Therefore, it is sufficient for us to study ourselves to find within us all the principles that will serve to resolve the great question of the existence of external objects" (D'ALEMBERT, 1994, p. 88). As the existence of external objects presents itself to knowledge and becomes its starting point, it can be seen as the principle of knowledge. Regarding this solution based on instinct, Veronique Le Ru highlights:

> D'Alembert demonstrates great skill and modesty in addressing the question of the existence of bodies. Skill, because, like Hume, he reduces the question to a problem of human nature, inviting us to trust our natural economy. Modesty, because, also like Hume, he presents his arguments as a legitimate means to bypass the question (LE RU, 1994, p. 148).

The solution through a rational instinct, forming the basis of a theory that seeks to eliminate innate ideas, continues to surprise us. It is through this instinct, linked to our own nature, that the author progresses from Descartes' second to sixth meditation. He achieves this without resorting to a device like doubt, as that would align him with the "philosophers Montaigne speaks of, who, when asked about the principles of human actions, try to ascertain whether men still exist" (D'ALEMBERT & DIDEROT, vol. 1, 2015, p. 51).

In this instinct-driven quest for advancement, he addresses the movement of bodies, for example, without delving into the problem of living forces or seeking to understand the driving causes. He completely disregards "the inherent forces of moving bodies" (STAROBINSKI, 2001, p. 69). For him, the driving causes are "obscure and metaphysical beings who do nothing more than spread darkness in a science that is already clear" (D'ALEMBERT, 1758, p. xvii). The very notion of force, to him, should not delve into metaphysical concepts such as living forces: "We do not have a precise and distinct idea of the word 'force'; we use this term to express an effect" (D'ALEMBERT, 1758, p. xxii). Advancing the concept of force beyond its effects would be detrimental, as the word 'force' "cannot consist merely of a very futile metaphysical disguise, or a word dispute even more unworthy of occupying philosophers" (D'ALEMBERT, 1758, p. xxii). In the entry on final causes, the author writes:

> If it is harmful to employ a priori final causes in order to uncover the laws of phenomena, it can be useful, and at the very least intriguing, to demonstrate how the principle of final causes aligns with the laws of phenomena, on the condition that these laws are initially determined from clear and indisputable mechanical principles (D'ALEMBERT & DIDEROT, vol. 3, 2015, p. 47).

For d'Alembert, causality seems to assume the role of a fundamental principle of thought that we attribute to objects based on our instinctive mode of cognition. It is presumed to be in harmony with the laws of motion, rather than serving as the origin of deductions derived from them. As Pedro Paulo Pimenta argues, "D'Alembert readily acknowledges that no investigation of nature could yield fruit unless it is equipped with a priori principles, understood as hypotheses, but also, and primarily, as principles accumulated through prior inquiry" (PIMENTA, 2018, p. 129). It is through the logical arrangement of logically ordered events that we can contemplate and act in accordance with a logical causality. Faced with the multitude of events, the geometer's mission is to "accumulate as many facts as possible, organize them in the most natural order, and connect them to a certain number of main facts from which the others follow as consequences" (D'ALEMBERT & DIDEROT, vol. 1, 2015, p. 73).

To grasp the significance of accumulated knowledge, consider D'Alembert's entry on "Experience" in the *Encyclopedia*: "Experience is the verification of the effect resulting from the application of one natural body to another, or the application of motion to a natural body, with the aim of discovering certain phenomena and their causes" (D'ALEMBERT & DIDEROT, vol. 2, 2015, p. 278). Here, the efficient cause comes into play as a physical cause, demanding an arrangement that often relies on hypotheses and previous investigations in a twilight illumination. We must move forward. By employing this expedient, we must endeavor to progress in knowledge and, in some way, free ourselves from a discomfort identified by Formey in the entry on atomism in the Encyclopedia, stemming from operating in a world where "the whole was made by chance, the whole sustains itself, and species perpetuate themselves also by chance: the whole will eventually dissolve by chance" (FORMEY in D'ALEMBERT & DIDEROT, vol. 6, 2017, p. 69).

Given this stride that allows us to advance, we are tempted to contemplate their operational mode as intertwined with what Diderot referred to as extravagances before embarking on the conjectures presented in his Interpretation of Nature, since "one cannot assign any other name to this sequence of conjectures founded on such remote oppositions or resemblances so imperceptible that the delirium of an ill person would appear no more disjointed or peculiar" (DIDEROT, 1961, p. 197). It is no coincidence that it is through the fevered words of his geometrician friend that the foundational conjectural elements of Diderot's theory are enumerated. In his fevered state, D'Alembert exclaims, "a living point... No, I am mistaken. Initially, there is nothing, and then a living point! Another point is applied to this living point, and then another; and through successive similar applications, a unified being emerges, for I am genuinely unified, and I cannot doubt it!" (as he uttered these words, he palpated himself all over) (DIDEROT, 2000, p. 166). The author, who held simplicity as his ideal, is reduced to the simplest element in geometry: a point. In Diderot's biting pen, geometry, which held great significance for his colleague, is applied to the science of living forms, but, more importantly, it presents his friend, who championed simplicity as his ideal, with the unfathomable dimensions of a mere point. If we consider the first "Definition" in Euclid's Elements, D'Alembert, the reconciler of opposites, is reduced by his friend to "that which is not part of anything" (EUCLID, 2009, p. 97).

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