

On Nothingness: Some Remarks

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The ultimate why question

Those who have never looked into the abyss of nothing do not realize the eminently positive character of the awareness that there is something rather than nothing: one of the fundamental problems of philosophy focuses on being, understood as the ultimate foundation, that which is in and of itself, by virtue of which and in which everything exists, a problem that causes another no less pressing problem, which concerns precisely nothingness. The question about being expresses the will to go back to something original, primordial, primitive; asking about the foundation raises the overwhelming possibility that there is no being, but nothing. So we return to the *Grundfrage* with unchanging passion, as if a strong mysterious force were insisting: why is there something rather than nothing? This is the fundamental question of metaphysics, or rather, the question at the beginning of every metaphysic, of every possible metaphysic, the question of the ultimate foundation and the first cause of what is, because the purpose of metaphysics is to explicitly reveal the true meaning of being. One may argue that this is a poorly formulated and meaningless question, but sadly, it would be more apt to observe that it poses a barrier to what we want to understand. Any reason to explain why there is *simpliciter* something, or something instead of something else, will require further explanation, so that the reason or any other reason will prove inadequate to explain what is and why something is. This question may be fruitless, but is still necessary (in dealing with nothing, oxymorons sometimes end up being inevitable), a pseudoproblem as Bergson argued, since nothing is never absolute, consisting in a positional rotation of things and mental states; but it is still a crucial, unavoidable question, which can be answered with blunt certainty: because being cannot not be; and that's that! In fact, we ought to carefully consider the question formulated by Leibniz in the *Principes de la nature et de la grâce*: "Pourquoi y a-t-il quelque chose plutôt que rien?" But if there is something, by the great principle (the principle of sufficient reason), there must be a reason why it is. In other words, it is not a question of verifying whether there really could be nothing instead of what exists, but of asserting that what is arises together with its foundation. It is evident that in Leibniz's formulation, the question has a rhetorical character, because the hypothesis of nothingness is completely foreign to the Leibnizian system. However, Leibniz not only proposes nothing as an alternative to being, but even underlines that it corresponds more closely to the criteria of simplicity and cheapness: "Car le rien est plus simple et plus facile que quelque chose". So we should ask why God preferred being to nothing, since nothing is simpler and easier than something. Nonetheless, this consideration is not sufficient to focus on the alternative between being and nothingness. When God decided that something was, one must explain why being is "so and not otherwise". The question posed by Leibniz therefore turns out to concern the necessity of the foundation, not that of the real possibility of nothingness.

'Because being cannot not be' is not a quip or provocation or a hasty attempt to dismiss the question. 'Because being cannot not be' means that the condition for every question is that there is being, which is the presupposition for every common sense view. It is no coincidence that Thomas writes: "Illud autem quod primum intellectus concipit quasi notissimum, et in quo omnes conceptiones resolvit, est ens, ut Avicenna dicit in principio Metaphysicae suae" (*De Veritate*, q. I, a. 1 c). That "ens est" is what our thought conceives as the most evident. In other words, our thinking is always thinking around something. And so our perceptive activity is always directed at something, it has being as horizon. Even if the universe were the work of an evil genius, we would be there as perceiving subjects with our act of perceiving, in addition to the evil genius: that is, there would always be something.

But reflecting on the opposition between being and nothing, we inevitably return to Parmenides, the first to explicitly elaborate the concept of nothing as absolute non-being, which is therefore "unthinkable" and "inexpressible". It is important to remember that in the lexicon of the ancient Greeks, there is no equivalent of the infinitive substantiated "being" distinct from being. The expression "being" is meant by the participle of the verb, sometimes preceded by the article (τὸ ὄν), which primarily indicates, in a demonstrative function, a specific entity brought to the attention of the observer. Sometimes ὄν can be used as a collective noun in place of the plural τὰ ὄντα to refer to the totality of things that are, or to indicate linguistic expressions, that is, forms of the verb to be. Therefore, the being spoken of in the fragments of the Parmenidean poem can be interpreted in the light of the clarifications just formulated, without having to presuppose an abstract notion of being or full awareness of the ontological problem.

The goddess who guides Parmenides in a kind of initiatory revelation indicates two paths of research:

Come now, I will tell thee - and do thou hearken to my saying and carry it away - the only two ways of search that can be thought of. The first, namely, that it is, and that it is impossible for anything not to be, is the way of conviction, for truth is its companion. The other, namely, that it is not (οὐκ ἔστιν), and that something must needs not be (χρεῶν ἔστι μὴ εἶναι), - that, I tell thee, is a wholly untrustworthy path. For you cannot know what is not - that is impossible - nor utter it (DK, B2).

For the philosopher of Elea, the opposition "ἔστιν"/ "οὐκ ἔστιν" (DK B 2, 3-5) is central, where the second term is understood essentially as "is nothing". He also reveals the absolute nullity of nothing (τὸ μὴ εἶναι); by virtue of this nothingness, nothing cannot be anything knowable and expressible. This elementary assertion "being is, non-being is not" contains the great secret: it is only possible to know something that is, that is a being, while it is not possible to know *nothing* because nothing absolutely cannot be. Parmenides says that being is and cannot not be and that non-being is not and cannot be. This assertion not only indicates a property, albeit a fundamental one, of being, but establishes its meaning: being is that which opposes nothing, thus prefiguring the central theme of metaphysics. The opposition between being (understood as what is) and nothing (understood as what is not) maintains its ambiguous character: being is the opposite of nothing, but clearly this opposition presupposes that being is, because if being were not, it would be nothing and not the opposite of anything.

But what is the subject of "is"? It is being, from which the classic expression "being is, not being is not" (οὐκ ἔστι μὴ εἶναι): οὐκ ἔστι, however, assumes in this case a modal value of possibility or reality: that which is not or is not given that it is not is not possible. But what "is" and not given that

"it is not"? What is the subject of the expression ἔστι, "is"? Whatever it is, a variable x, any anything. In any case, it is a question of εἶναι, of what is and cannot not be. Of something that as an entity, is, we must always say that it is, and it is not legitimate to say that it is not. An entity is something that is, not something it is not, although this may appear to be a mere tautology: "It needs must be that what can be thought and spoken of is (τὸ εἶναι ἔμμεναι); for it is possible for it to be (ἔστι γὰρ εἶναι), and it is not possible for, what is nothing to be (μηδὲν δ' οὐκ ἔστιν)" (DK B6, 1-2).

Here the subject is τὸ εἶναι; and ἔστι εἶναι does not mean "being is", but once again "it is given to be". When we read "nothing is not" one should not think of an ontologization of nothing as if "nothing is not". The term μηδὲν in the function of subject means nothing, no entity: no entity, as entity, is not.

In the *Sophist* (237 b7 ff.) Plato dwelled on this question, posing the problem of τὸ μὴ εἶναι, "what is not": τὸ μὴ εἶναι evidently does not refer to what is, nor to what is indicated by τί, from something, since 'something' always refers to a thing that is. In fact, when we say "there is something in the pot", 'something' stands for something that is. In other words, saying or thinking something is saying or thinking something that is. However, the statement "what is not, is" cannot be treated in exclusively rational terms: "For this shall never be proved, that the things that are not are (εἶναι μὴ εἶναι)" (DK B7, 1).

In this case, μὴ εἶναι, the things that are not, appears in place of the previous τὸ μὴ εἶναι. Non-being is not an abstract concept, but a possible state of things, of things that are not: "It is the same thing that can be thought and for the sake of which the thought exists; for you cannot find thought without something that is (τὸ εἶναι), to which it is betrothed" (DK B8, 34-37).

Something becomes the object of our thought when it is: the being of something is expressed precisely in the linguistic form "is". But then what does the Parmenidean εἶναι refer to? It probably referred to the phenomenal world, to things that are. Parmenides, an ancient sage, wonders about questioning the origin of the phenomenal world from a cosmological perspective. The answer he provides, however, is formulated on a logical-rational level, not on an empirical one: everything that is cannot have been preceded by a condition in which there was nothing: "And, if it came from nothing, what need could have made it arise later rather than sooner?" (DK B8, 9-10).

How can we imagine a "nothing" if all that we can represent is something in any case? *Ex nihilo nihil fit*. These are obviously *a priori* arguments, from which an explicit formulation of the ontological problem does not clearly emerge. Parmenides turns his gaze to the phenomenal world and notes that it is inhabited only by things that are and that happen continuously in a world saturated with being. Therefore he assumes that being, in its generality, is one and continuous, since the things that are constitute a totality without any kind of interruption.

As we have said Plato is the first Greek philosopher to open the door of the ontological problem in order to resolve the pressing question of non-being. The Parmenidean interdict stands out in the Platonic dialogue: it is not possible to say or think what is not. In fact, thinking about what it is not, or talking about it, generates incurable aporias, which the Stranger of Elea grasps with stringent logic: to say only "what is not" implies the attribution of a quantitative determination to this "nullity", a number (singular), which can only be attributed to something that is. But if non-being remains enveloped in a mute fog, being, that which is, also remains shadowy:

Stranger: Now we have not discussed all those who treat accurately of being and not-being; however, let this suffice. But we must turn our eyes to those whose doctrines are less precise, that we may know from all sources that it is no easier to define the nature of being (τὸ ὄν) than that of not-being (τὸ μὴ ὄν) (Soph. 245e-246a).

Plato does not recognize a clear awareness of the ontological problem in his predecessors, in first place Parmenides: **“Stranger:** It seems to me that Parmenides and all who ever undertook a critical definition of the number and nature of realities have talked to us rather carelessly“ (Soph. 242c).

Plato sets out to understand what the being attributed to things consists of, or the meaning of expressions that, in various forms and to different degrees, denote being:

Theaetetus: What do you mean? Or, obviously, do you mean that we must first investigate the term “being,” and see what those who use it think it signifies? Stranger: You have caught my meaning at once, Theaetetus. For I certainly do mean that this is the best method for us to use, by questioning them directly, as if they were present in person; so here goes: Come now, all you who say that hot and cold or any two such principles are the universe, what is this that you attribute to both of them when you say that both and each are? What are we to understand by this “being” (εἶναι) of yours? Is this a third principle besides those two others, and shall we suppose that the universe is three, and not two any longer, according to your doctrine? For surely when you call one only of the two “being” you do not mean that both of them equally are; for in both cases they would pretty certainly be one and not two. Theaetetus: True. Stranger: Well, then, do you wish to call both of them together being? Theaetetus: Perhaps. Stranger: But, friends, we will say, even in that way you would very clearly be saying that the two are one. Theaetetus: You are perfectly right. Stranger: Then since we are in perplexity, do you tell us plainly what you wish to designate when you say “being” (ὄν). For it is clear that you have known this all along, whereas we formerly thought we knew, but are now perplexed. So first give us this information, that we may not think we understand what you say, when the exact opposite is the case (Soph. 243d-244a).

Here, then, is the formulation of the problem, the nature of which is first of all semantic: in fact, we ask ourselves about the meaning of expressions such as “to be”, “is”, “who is” with evident ontological implications.

Therefore, if what is something differs from what is thought of as non-existent by virtue of its logical non-contradiction, that is, according to its disposition to be thought and represented, absolute nothingness (*nihil negativum*) is defined as negation, as contradictory: it would be impossible to represent, and unthinkable, which implies contradiction, set A and not-A. In other words, no subject belongs to contradictory predicates, or the subject is nothing, that is, it is not. $0 = A + \text{non-A}$. This absolutely first proposition is called the principle of contradiction. (A. G. Baumgarten, *Metaphysica*, 1739, §7).

As soon as it is argued that being is not nothingness, nothingness is *ipso facto* ontologized as included in a proposition in which the subject (nothing) is being predicated, so that it dissolves as nothing to become being. There is evidently talk of *nihil absolutum* (τὸ μηδαμῶς ὄν), of which Plato speaks in the *Republic*, the Kantian *nihil negativum* (*das Unmögliche*). Being is being and being is not non-being (principle of non-contradiction): being is and non-being is not. Non-being (μὴ εἶναι), nothing (μηδέν), is certainly not relative non-being, the other (ἕτερον), the different, but it is what there is beyond being, what is contrary, against being (ἐναντίον). However, it happens that in order to deny nothing, it becomes necessary to recognize it as an entity: therefore we end up ontologizing what is

not: then what we intend to deny is no longer nothing. Thus the intimate aporia of nothingness takes shape. Plato shows that he is fully aware of it in the *Sophist*, where he tries to overcome non-being, through admission of being, defining nothing as "otherness":

Stranger: Why, my dear fellow, don't you see, by the very arguments we have used, that not-being (τὸ μὴ ὄν) reduces him who would refute it to such difficulties (ἀπορίαν) that when he attempts to refute it he is forced to contradict himself? (*Soph.*, 238d 5-8).

Thus, conducting the famous "patricide" of the master behind the mask of the Stranger of Elea, he sets the distinction between absolute nothing and relative nothing: "When we say the 'non-entity' we do not say something contrary to the entity, but only something different, which precisely for this reason possesses" in a stable way "the nature of being" (*Soph.*, 258 c). Nonetheless, clarifying the sense of non-being, understood as something other than being, to save the multiplicity from Parmenides's dismissal of it, leaves unresolved the paradox of not being, understood as the opposite of being. What is not (τὸ μὴ ὄν) cannot refer to something that is, nor to something that may or may not be. It is contradictory to predicate the being of non-being and at the same time conceive non-being as a predicating subject.

Being opposes nothing; but it is evident that it can only oppose because it is and when it is; because, if it is not, it is nothing and does not oppose anything. Thus Aristotle affirms in the *De Interpretatione* (19a 23-27):

Now that which is must needs be when it is, and that which is not must needs not be when it is not. Yet it cannot be said without qualification that all existence and non-existence is the outcome of necessity. For there is a difference between saying that that which is, when it is, must needs be, and simply saying that all that is must needs be, and similarly in the case of that which is not.

In this perspective, Parmenides's words can only reveal their ambiguity: being is, but when it is; non-being is not, but when it is not. We must be able to distinguish between the necessity that being is when it is and the unconditional necessity that being is, between the need that non-being is not, when it is not, and the unconditional necessity that non-being is not.

What does "is" mean in the assertion: "Being is", except that being "is not nothing"? "Is" means "not nothing", "against nothing", "absence of nothing", "victory over nothing". After all, every reflection on nothing is preceded by the ascertainment of an absence, a lack, a gap, of something that is not there, of the being that sometimes seems to rarefy, to disappear, leaving in our existence spaces that we would like to fill. But these are still portions, fragments, shreds of nothing, which are embedded in the whole, which are surrounded, forced, crushed by being. The idea of nothing, even if vague and indefinite, brings anguished problems to our awareness; consideration of the ultimate issues of these problems make the head spin. We can reflect on nothing as the totality of what is not but which could possibly be, as annihilation of all that is but might not be, considering the claim to reduce it to a simple logical negation to be excessive. We can ontologize it to make its thinkability possible, rethematising "the abyss of absolute nothingness" as a preliminary problem of philosophy and metaphysics: it means ultimately returning to reflect on being in its generality, pure without determinations, primitive concept, the-beginning of every possible metaphysic, understood as Aristotelian knowledge of the first principles and the causes:

For the man who desires knowledge for its own sake will most desire the most perfect knowledge, and this is the knowledge of the most knowable, and the things which are most knowable are first principles and causes; for it is through these and from these that other things come to be known, and not these through the particulars which fall under them. And that science is supreme, and superior to the subsidiary, which knows for what end each action is to be done; i.e. the Good in each particular case, and in general the highest Good in the whole of nature. Thus as a result of all the above considerations the term which we are investigating falls under the same science, which must speculate about first principles and causes (τῶν πρώτων ἀρχῶν καὶ αἰτιῶν); for the Good, i.e. the end, is one of the causes (*Met. A, 2, 982a 30-982b9*).

Is there nothingness?

By definition, being is the denial of nothing. By virtue of the *φύσις τοῦ ὄντος*, being is being and not nothing, so that it is not possible that being is nothing. Denying nothing, being ontologizes it, but ontologized nothing is not something: it is, however, an entity and not more nothing. Precisely in affirming that ontologized nothing is being and not nothing, it is revealed that nothing is an entity and it appears clear that ontologization does not have a negating but an affirming character. And so the nothing, too, becomes an entity, the nothing which is not only the opposite of being, but appears as an *aliquid* whose presence becomes co-essential to being. Each entity in fact opposes its own essence to nothingness, understood as an irreducible possibility that it is not. Nothing disturbs us, it worries us, not as non-being, but as an eventual possibility inherent in every entity.

However, it is reasonable to observe that what determines with its presence the conditions of thinkability of nothingness, since nothing is coessential to being. It therefore follows that while the essence of being can be defined conceptually, (nothingness, *nulleitas*) the essence of the nothing, understood as non-essence, can only be thought of in relation to being: nothing is what is not. It will be said that the term "nothing" is meaningless as it does not refer to any entity in the phenomenal world; nothing means precisely lack of any meaning, in the sense that it does not refer to phenomenal anything and as a term is meaningless. In fact, "nothing", understood as a denoting concept opposed to being, is a denoting concept that denotes nothing. "Nothing" evidently does not refer to anything denoted, i.e. "nothing" does not denote anything. In other words, the concept denoting "nothing" does not refer to any entity. So far we have dealt with nothing from the logical and linguistic points of view. Now we have to ask whether we can downgrade the problem of nothing to a pseudo-problem on a strictly logical-propositional plane, confusing *ratio loquendi* with *ratio essendi* and therefore binding what is and what is not to the properties of ordinary language and our conceptual system?

Thinking nothing is equivalent to thinking about nothing or is it not rather a supreme instance referring back to an extreme and ever-looming something that hails back to the origins of our culture and many other cultures? A conception of nothing can be traced in many myths, sagas and legends that humanity has associated with the creation or the end of the world over the centuries, describing them with tremendous images of darkness, night and abyss. But can we adopt the condition of thinkability as a criterion for the possibility of nothing? Does the fact that individuals cannot think of anything necessarily imply that there is something? Is this not an argumentative fallacy? We cannot imagine our reality as non-existent and therefore reality can only be this? For example, many people are unable to imagine curved space, yet the theory of relativity explains that we live in a four-

dimensional space-time dimension that violates Euclidean geometry. Think also of Bergson, who advocated self-contradiction of the idea of absolute nothingness, because at least one individual would formulate it, so that every possible world would contain a conscious observer, although a universe devoid of conscious observers is physically possible¹. In addition, when Bergson argues that even if he were able to prevent stimuli from the outside world from reaching his sensory organs and get rid of any mental state, he still could not suppress his conscience, which proves that since it is inconceivable, nothing is not a possible reality. This principle (that which is unthinkable is impossible) has a paradoxical consequence: if Bergson cannot think of himself as non-existent (the irreducibility of his conscience prevents it), he should conclude that his non-existence is impossible: this would mean that the existence of Henri Bergson is guaranteed in every possible world.

We turn to being and stand before being: its presence comforts us and confirms our being in the world. The unveiling of nothing, understood as absolute negation of the totality of being, like something the existence of which cannot be admitted, sweeps away any consolatory ambition and we find ourselves at the edge of the abyss. The dizziness of being is experienced as on a midsummer night, alone in naked silence with heavenly immensity above us, in anguish we realize our finitude and being seems to vanish in the haze of darkness: we would like human arms to squeeze and comfort us and bring us back to being.

We want to express our bewilderment in unspeakable words, breaking the chains of language, aware of the irreducibility of the world to logical-discursive structures. However, the logical-discursive inexpressibility of the experience of nothingness does not diminish or render vain the task of metaphysics, which is to say something about the meaning and sense of life, even if this saying does not add anything to our knowledge. Here the thought of nothing, as an expression of the will to think the inconceivable constituted by an absolute, aporetic, illogical, absurd negative, determines the dark background, against which *that which is* stands out in its fullness of meaning. As Aristotle states at the beginning of *Metaphysics* (I, 2, 982 b, 12-13), "it is through wonder (*διὰ τὸ θαυμάζειν*) that men now begin and originally began to philosophize". The wonder experienced on discovery of the whole, when one observes all the entities that are (*πάντα τὰ ὄντα*), needs to be expressed in the form of language. The antiphrasis of nothingness therefore become necessary, with all its logical and metaphysical equipment, despite the faultiness of terms such as being, nothing, positive, negative, etc. inherited from Plato and Aristotle, to fill that gap of meaning inherent to the existence of the human species.

Is a non-universe possible?

The concept of nothing – especially but not only in ordinary language – is sometimes associated with the concept of emptiness: saying that this page is empty is to say that nothing has been written on it, or saying that a bottle is empty means that it contains nothing, and so forth, although it is worth specifying that in these examples "nothing" occurs as an indefinite pronoun and not as a noun (nothing). In a world saturated with things, facts and excesses, refractory to essentiality and lack, it

¹ See H. Bergson, *L'évolution créatrice*, Félix Alcan, Paris 1907.

is truly singular that philosophy has given up reflecting on the only concept close to that of nothing, which moreover has ontological consistency: that of emptiness. Denied by Parmenides and the Eleates, for whom it coincided with non-being, in the ancient Pythagorean tradition and for the atomists, the void not only exists, but is also the ontological principle of entities; dialectically connected with the concept of full, for the atomists the concept of void indicates the infinite space between the atoms, the void in which they move, the condition for atomic motion to occur (DK 67 A 1).

In physical terms, we know that a vacuum is never absolute, it is not empty: a container emptied of air still contains atoms and molecules. The vacuum state characterizes a system that does not contain material particles, such as those which constitute molecules and atoms, while it may contain waves and electromagnetic fields. Anybody at a temperature above absolute zero (-273.15°C) emits electromagnetic radiation. It is therefore only possible to obtain an absolute vacuum, free of matter and radiation, at absolute zero. This however does not apply in quantum mechanics, where according to Heisenberg's uncertainty principle, energy and time, like other quantities such as position and velocity, cannot be measured with absolute accuracy: however accurate and precise an experiment may be, it will never succeed in simultaneously establishing the position and velocity of a particle. In fact, if we observe this vacuum at a sufficiently small scale we realize that it is not empty: in a quantum vacuum there are quantum-mechanical fluctuations that make it seethe with particles and virtual antiparticles (ghost particles), which under certain conditions can transform into real particles when they interact with another particle such as an electron, but which in general arise and are annihilated in very short time intervals. It is a dynamic vacuum in which the energy fluctuations predicted by Heisenberg's principle give rise to mass and therefore to particles according to Einstein's equation $E = mc^2$. The intuitive image of the emptiness derived from it is that of a sea seething with possibilities, since fluctuations concern what could happen at the moment of measurement and not events in the classical sense: think of white noise, the random background signal that the radio emits between one station and another: it is not a real signal, nor is it silence.

Most of the universe consists of empty space, which still contains matter: about two thousand billion galaxies, each with two to four hundred billion stars. If the distribution of matter in the universe is not homogeneous, it nevertheless tends to gather on a wide range of scales under the action of gravity. Galaxies tend to come together in groups and clusters, which in turn aggregate to form superclusters, which bind to each other with filaments and walls of galaxies. But is it possible to imagine a null universe, an absolutely void universe, a universe in a condition of absolute nothing, a *non-universe*? This is possible if we use so-called *free logic*, a logical language without the assumption that every singular term is denoting. A term is said to denote if it refers to an existing object or individual; a term like "Pegasus" or "the current king of France" is not denoting. In the language of predicates, every term is denoting. So, given a property P and a letter t which represents a singular term, it is possible to deduce logically from the predicative statement "the property P holds for the term t", the proposition "there exists an x such that the property P holds for x". This is not valid in free logic. In fact, by introducing a non-denoting term such as "Pegasus", it is not possible to deduce from "Pegasus is a winged horse" the proposition "there exists an x such that x is a winged horse". Free logic systems have adequate semantics: the simplest approach is to refer to a universe of discourse which includes, in addition to a set of "existing" individuals on whom we quantify, also a set of "possible individuals"

but not existing, who are used for the interpretation of non-denoting terms. A *non-universe* would therefore seem logically possible: by analogy with the empty or null set of set theory, that is, a set that does not contain any element and can be defined intensionally by any assertion that is not verified by any element (for example, \emptyset {knives without handle whose blade has been lost}), but which is still considered something. By the term non-universe I am not referring to an *aliquid*, but to a possible universe that does not imply space-time and does not contain any entity of any kind, i.e. one of the ways reality could occur, a reality that is absolutely empty, but that could possibly be something.

Quine found that in such a universe, a very easy proof of truth and falsity would apply: all existential propositions (there is an x such that ...) are automatically false, while all universal propositions (for each x ...) are automatically true. For example, "for every x , x is brown" is true in a universe without objects, because it is certain that there are no objects that are not brown. The assumption that nothing exists then does not seem to generate contradictions, so that from a logical point of view there could be nothing: $(x) \neg (x = x)$. The non-universe is absolutely simple, because it does not contain entities or properties with causal relationships between them and its degree of entropy is zero. According to the second principle of thermodynamics, we can affirm, in a non-rigorous but explanatory form, that when a system passes from a state of ordered equilibrium to a disordered state, its entropy increases. So if a system – whatever it is, from a glass of wine to a possible world – can exist in N different states, its maximum entropy is equivalent to $\log(N)$. Since the non-universe knows a single possible state and is therefore not subject to state variations, its maximum entropy is $\log(1) = 0$. Thus we can consider the non-universe, which contains nothing, the simplest and most orderly reality with the best entropy profile. All that remains to understand is why nothing prevailed over being.

There are theories that support the existence of one or a few states or situations N that are natural and need no explanation, unlike others that must be explained as deviations from N due to the action of forces F that move them away from their natural state. Such theories can be defined as *inegalitarian* in the sense indicated by Nozick². A theory that divides states into two classes, those that require an explanation and those that neither need nor admit one, is defined as *inegalitarian*. Such theories are suitable for answering questions like "Why is there X instead of Y ?" There is a state contrary to the N state, a non- N state, instead of an N state due to the forces that caused the system to move away from N . And if there is an N state, there is a reason why no counterbalanced force has moved the system away from N . When we ask "why is there something rather than nothing", we assume that nothingness is the natural state that requires no explanation, while deviations from nothingness must be explained by introducing particular causal factors. It would be possible to imagine that nothingness, as a natural state, arose from a very powerful force capable of destroying the structure of the universe and then annihilating itself.

This hypothesis finds its cosmological counterpart in the theory called the *Big Rip*, according to which the universe, arising with the *Big Bang*, is expanding outwards with increasing acceleration due to an unknown form of energy, called *dark energy*, which is estimated to occupy 70 percent of the universe. The expansion of the universe progressively reduces the density of dark matter and visible matter, whereas the dark energy (that repels matter) remains almost constant and unchanged. It follows that dark energy will gradually become the dominant force (over gravity, electric, nuclear forces, etc.),

² See R. Nozick, *Philosophical Explanations*, Harvard University Press, Cambridge, MA, 1981.

first causing stars to move away from galaxies, then planets away from stars. The universe is thus reduced to a series of elementary particles isolated from each other and unable to interact. The final state is a rarefying gas of photons, leptons and perhaps protons.

But if the natural state were being, a fullness of existence, which tends to move away from that fullness due to the action of particular forces? As we have seen, our venerable philosophical tradition conceives existence as more perfect than non-existence. Yet it would be completely legitimate to consider the possibility that matter evolves to more rarefied forms of energy and existence, until it reaches nothingness. In such a case, perfection would not coincide with the natural state: there would be something rather than nothing, because this is not (yet or perhaps) the best of all possible worlds. However, asking why there is something rather than nothing presupposes that nothingness is a natural state that does not require an explanation, while all deviations from nothingness need one. In truth, we are unable to establish what the natural state is and we do not know if there is a fundamental natural state, assuming that the right fundamental theory has inegalitarian structure in the sense indicated by Nozick. In any case, when we ask why there is something rather than nothing, we assume that nothing is a natural state; otherwise (i.e. if we no longer consider nothing a natural state), the question as it was posed does not make sense. Therefore we should not ask "why is there something rather than nothing", but "why does something exist instead of not existing?"

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