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TURING AND THE FACE OF THE UNIVERSE

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Abstract

This article addresses issues and individuals as (seemingly) disparate as Atapuerca, the process of hominization, thought experiments with steel balls, Galileo, Descartes, Blade Runner, Turing, and electronic forms on the Internet, in order to recall something that is forgotten time and time again: God is beyond the knowledge that is provided by and achievable through the experimental scientific method.

Keywords: experimental-scientific method, existence of God, Turing's test

1. Sudden leaps in human evolution

Recently, coinciding in time with the reading of *Basements of the Universe*, by Juan Arana [1], I attended a conference on human evolution given by Professor José María Bermúdez de Castro [J.M. Bermúdez de Castro, *Hominización y humanización (Hominization and Humanization)*, Conference given at *Ser humano y crisis*, V Encuentro de la Escuela de Pensamiento de Silos (Humans and Crisis, V Encounter of the Silos Thinking School), Abadía de Silos, November 17th 2012, (<http://www.escueladepensamientodesilos.com/eventos/ser-humano-y-crisis-existencial-y-economica.html>)], co-director of the Archaeological Site of Atapuerca and director of the Museum of Human Evolution in Burgos, Spain. When it came to question time, there were several interventions along the same lines from the audience, which could be expressed as follows: Is it possible to assert that in the process of hominization there has been a totally singular turning point, a leap that is inexplicable from the scientific point of view? What could be glimpsed through these questions, repeated in different forms again and again, was the desire to find a sort of *scientific proof* of an extraordinary intervention by a supernatural being, i.e. a proof of God's existence. As I expected, the biologist did not rise to the bait, but confined himself with great elegance to what he could say within the terms of his discipline, Paleoanthropology. In short, what he said amounted to the assertion that, if we want, we can consider extraordinary the whole process; but in any case, given our current knowledge, we cannot point to any particularly unique moment that cannot be scientifically explained.

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2. Thought experiments

I would like to illustrate this thesis with a sort of Galilean *thought experiment*, which I hope will serve as a convenient analogy for the evolutionary process discussed so far. Galileo loved playing with sloping ramps and rolling balls to measure the falling of bodies. The use of low-slope ramps that retard the fall was the only way to make reliable measurements of time and space with the instruments available at the time. Maybe this was his greatest contribution to Physics, not only because of the law he happened to formulate (the distance travelled is proportional to the square of the time elapsed in the fall, and is independent of body weight), but perhaps more radically because of the research method he used.

Suppose we perform the following experiment with the „saw-tooth“ ramp in Figure 1. We let the ball roll on the first segment until it reaches the vertical „wall“. Then we take the ball with the hand and raise it to set it rolling down the second segment. Suppose the ramp and the ball are white against a black wall, and the hand that moves the ball also wears a black glove, so that we cannot see it against the black background. We could even record the experiment with a video camera for a more convenient analysis of the trajectory of the ball. Our observation of the phenomenon can be represented with the dotted arrows in Figure 1.

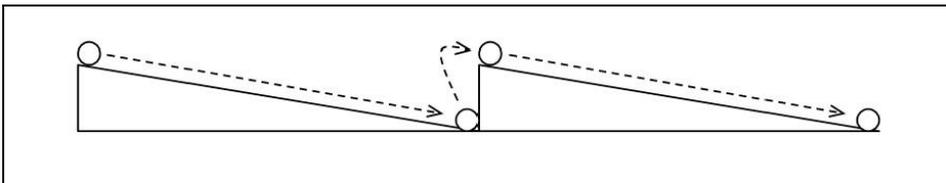


Figure 1. A Galilean *thought experiment*: does the anomalous trajectory require a supernatural intervention?

What can we see here? Well, no more and no less than a *sudden leap*, which would be analogous to a sudden leap in human evolution, if such a leap were to be discovered (which, as I said, does not seem to be the case in the present state of Science). The ball obediently follows the laws of Physics in its first fall, before suddenly taking a completely anomalous and unforeseeable behaviour: it climbs up the vertical wall *against* the law of gravity; then it goes back to obeying the usual law of nature in its second fall. I insist, this is the *phenomenon* we can observe, the trajectory of the ball; the *explanation* we give for that phenomenon is another matter.

In particular, it is impossible to *explain* the sudden leap of the ball according to the law of gravity. Should we then conclude that there has been some kind of *supernatural intervention* that has raised the rolling ball up to the second ramp? In a way, yes... since the hand that lifts the ball acts according to a lawfulness which is *above nature*, as it is merely expressed in the laws of falling bodies. But, strictly speaking, it is not at all a supernatural intervention, since the

movements of the hand are also subject to the laws of Mechanics, albeit in a broader framework of understanding than the law of gravity alone.

In fact, there are many natural processes that exhibit a *critical point* where the gradual change ceases to be gradual and becomes abrupt. A simple example is the phase transition from liquid water to vaporized water: of course, we do not need a supernatural cause to explain it. So, the observable existence of critical points has nothing to do with the difference between the natural and the supernatural, or with inexplicability; instead, it is something quite normal in the Natural sciences [2].

3. Unexplained phenomena

In short, *observing phenomena that cannot be explained by known laws in the present state of Science does not in any way allow us to posit the intervention of supernatural causes*. Unexplained does not mean inexplicable. There is no *physical phenomenon*, considered as such, which requires the existence of a *meta-physical cause*. The scientific method, in and of itself, does not lead to the discovery of any supernatural intervention in nature. In the words of Professor Arana, when addressing the origin of life [1, p. 252]: “Although the experts do not know which card to choose, they know very well what deck they are playing with. (...) Those who are searching for the origin of life agree that the problem has to be addressed within the field of Biochemistry; they have no doubts about the pieces of the puzzle, even if the task of assembling it still escapes them.”

God, at least in Jewish-Christian tradition, is a transcendent being, i.e. it is beyond physical nature. This means, among others, that God is not a physical entity (it has neither corporeal body nor any other kind of physical existence, such as electromagnetic waves), thus it cannot *interact* with any physical entity. This leaves open the philosophical and theological question whether God can *intervene* in nature, in a way that is not a falsifiable physical interaction, but which is still a meaningful, non-irrelevant but also non-falsifiable, sort of intervention. God’s intervention in nature (not falsifiable) is not God’s interaction with nature (falsifiable); this simple distinction makes futile so many debates between naïve theists and naïve atheists.

There is not, nor can there be, a scientific *test* for the existence of God and its intervention in nature. This does not mean that it is impossible to know the existence of God; it simply means that the scientific method is not the right way to prove (or disprove) this existence. Which is not at all strange, since the scientific method is self-limited to natural phenomena. This limitation is a problem only for those who believe that the scientific method is the privileged way, or even the only way, to attain the knowledge of reality (or, conversely, that reality is only what can be known by the scientific method). The knowledge of God and other transcendent realities can only be achieved through a broader conception of reason, which is only possible, in the words of Joseph Ratzinger, “if we overcome the self-imposed limitation of reason to the empirically verifiable, and if we once more disclose its vast horizon...” [J. Ratzinger. *Faith*,

Reason and the University. Memories and Reflections, Papal Address at University of Regensburg, September 12, 2006, <http://www.zenit.org/en/articles/papal-address-at-university-of-regensburg>]. Incidentally, this opening of reason to a reality beyond pure phenomena will be very beneficial for many other fields of knowledge, and in the first place for the scientific method itself [3].

4. The Turing Test and the Descartes Test

Arana suggests the possibility of designing a Descartes Test (along the lines of the famous Turing Test) to discriminate between living and nonliving things, and he examines some of the difficulties that this test could come up against [1, p. 248-250]. The test would consist of a list of essential features of living beings, such as „it is a corporeal being that is born, nurtures, reproduces and dies“. These features define a living being... for the moment, or as far as our current knowledge of living beings is concerned. The main problem with the test is that this is necessarily *an open list*, since our scientific knowledge of living beings is continuously enriched (and surprised) by experience. The Cartesian tester demands a closed list, but the biologist is incapable to provide it. It could happen that human-produced artefacts pass this test, such as mechanical automata, electronic robots, organic-mineral hybrids, products of molecular engineering, etc.; or else it could happen that newly discovered entities (terrestrial or extra-terrestrial), do not pass exactly the test in all its fullness. In both cases, the biologist could be tempted to redefine the list of features in order to include or exclude these new natural or artificial entities. Should we exclude mechanical automata, even if they pass the test (false positives)? Should we include (in a hypothetical future) those strange Martian things that resemble traditional living beings, even if they fail the test (false negatives)? Resisting *always* the temptation to redefine the test would be a mistake.

Therefore, a more fundamental issue is that we cannot design the test if we do not know *somehow* in advance what life is. Why choose some criteria instead of others to discriminate between the living and the non-living? We can choose discriminatory criteria (tests) because we already know, albeit in a vague and informal way, what is a living thing and what is a non-living thing. I do not deny the usefulness of the criteria: defining them helps us better to shape our knowledge. I only say that the criteria are not at the beginning of our way towards knowledge, but rather in the middle, far from the end, too; an end that cannot merely consist in a list of criteria, tests and measurement procedures.

Exactly the same applies to the Turing Test, which is an empirical test to discriminate between a person and a machine. The test was devised by Alan Turing [4], eminent founder of Computer science, the centenary of whose birth was celebrated in 2012. The test, which was superbly represented in the movie *Blade Runner*, consists in asking questions to a partner until it becomes clear whether one is addressing a person or a machine. Today it has become commonplace: I dare say that any reader will have been subjected to some

particular form of the test, not once but many times. Indeed, every time I have to interpret the distorted image of a word at the end of an electronic form (technically known as CAPTCHA, an acronym for Completely Automated Public Turing test to tell Computers and Humans Apart [<http://www.captcha.net/>]), I am being subjected to a test to verify that I'm a person, not an automated process (a robot); and this is something that now happens to me almost daily. The Turing test works because we know *in advance* that people pass and machines fail, i.e. properly speaking we do not need a test to distinguish people from machines. It is machines that need a test do discriminate, not humans! The problem with this technique is that robots dedicated to surfing the Internet, trying to act as real persons and automatically filling in these forms, are continually evolving, so that it is necessary to adjust the technique over and over again to keep it effective. Machines do need the discriminatory test because they do not *know* the difference; instead, humans can program better and better tests because they do know *the difference beyond the test*, as it is evidenced by their ability to recognize false positives and false negatives. In other words, knowledge that can be reduced to a mechanical application of a test or procedure is not the essence of human knowledge.

The Turing Test is a behaviour-based criterion designed for effective discrimination. Other criteria may also be established based on morphology or origin: a human is someone who behaves like a human, who has human form, who has a human origin. But one effect of the advances in engineering is that any of these criteria will face the same difficulties as the Turing Test. The definition of a human being as *a speaking biped* was valid a few decades ago. But not any longer today, and any empirical test that we are able to devise will probably cease to be valid in a few years' time. To be effective and repeatable, any test will require a rigorous and formal definition; but it is precisely the rigor and formality of the definition what allows to design a machine that passes the test; when passing the test becomes a *closed problem*, then trying to solve it mechanically is feasible.

Thus there can be no static criterion for defining what is a person; no criterion that can be used to determine once and for all, by an empirical, rigorous and formal test, whether a being is or is not a person. Actually, this is nothing new for those who are aware that *person* is a meta-empirical concept, i.e. meta-physical. Being able to see a person's face where a video camera records only colours in motion is a capability that goes beyond the sensory perception of phenomena. Artificial vision techniques that are able to recognize a human face will never be able to recognize a being that is worthy of respect, a person. Being able to see *the other's face* is something that lies beyond any empirical test that we can devise.

5. The face of the Universe

Has the Universe a face? In other words, is there Anyone of whom we can say that the Universe is his face, is there Anyone whose face we can contemplate

in the Universe? Throughout history many have tried to present the physical Universe as God's face, as a more or less obvious manifestation of its existence and *mode of being* (its intervention). As Arana [1, p. 304] writes, "believers have always seen confirmatory vestiges of their faith in the world, and just the opposite the unbelievers of all ages". The truth is that natural phenomena, in and of themselves, present a strong ambivalence: "No one can deny that nature in general, and especially living nature, offers a spectacle that is at once wonderful, surprising, *touching and terrible*" [1, p. 305].



Figure 2. Are natural phenomena a CAPTCHA for God's Providence?

Let me return to the point already made earlier in this essay: the key to contemplating the face of God in the Universe does not lie in the analysis of phenomena, as if some phenomena would point to God and others rather in the opposite direction. Even accepting that the complex simplicity of the Universe "clearly *exhibits* the mark of intelligent choice in its legal framework" [1, p. 323], to be seduced by this *exhibitionism* requires being able to see beyond phenomena, to see the hidden meaning in the captcha (Figure 2). Again, I am not saying it's impossible to contemplate God in nature, but only that natural phenomena are themselves radically insufficient to empirically prove its existence as Creator, and even less as a Providential One. Ultimately what I am saying is in profound agreement with one of the key assertions of Arana's book: "The thesis that God is the Lord of History is in no way refutable, thus it is not a scientific thesis either" [1, p. 307]. Let us not succumb to positivist scientism: there is no scientific test for the existence of God, and that is not something we need to grieve about.

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