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**BEYOND THE
FINAL FRONTIER**

Everything for the Theory of Everything

An Epistemological Study

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PART ONE: BEYOND MATTER

Everyone is free to seek what is beyond, but not everyone embarks on such an adventure. We leave behind everything that gave us the confidence that we know. What we don't know, what we don't suspect, and we cannot even imagine, awaits us.

THE BEAVER OR ARCHIMEDES?

“When we proudly realized what smart species we are, we considered that the history of mankind is marked by the development of tools we made and which were supposed to prove our unmatched superiority. With their help, we, humans, get our food, build cities and master forces much stronger than our arms.

But, we found out we have a big problem: animals. They keep surprising us with astonishing evidence of their intelligence. In order to get their food, to have a nest and a partner, to leave descendants, all living things, whether they are bacteria or elephants overcome with the help of intelligence complex life problems.”

“Of course. In this way life could evolve, I see nothing amazing.”

“Yes! But we often consider ourselves superior to animals, although intelligence also characterizes us and them. And then, are we, people, really special or do we just want to believe that? If we were, there should be something, a peculiarity of the human mind that’s a characteristic feature in addition to other intelligent minds. And the truth is that, in addition to intelligence, we really have a trait that animals lack.”

“What exactly?”

“The reason.”

“We show reason and animals don’t? How do you know?”

“From the animals. If we look closely, we can see what the difference is between us and them. Let’s take an exceptional example. The beaver. A rodent that prefers water. A builder. From the bank of the river, upstream of the place where he chose to lay his house, he chews the trunks of the trees until he breaks them. He lets them flow down the river and locks them in a well-chosen place. He inserts sticks, stones and earth between them and around them. Thus, he builds a dam that can generally be 20 or 30 yards long and up to 3 yards high. It has to be a particularly strong construction, to withstand a large amount of water which exerts immense pressure. Each beaver that cuts with his little teeth the trees and takes them to the bottom of the water to fix them there, uses only his intelligence.”

“So, do you mean that such a builder doesn’t show reason?”

“No! Just intelligence.”

“Interesting. What makes you so sure of this?”

“If only one beaver thought that the tree trunk is pushed from the bottom upwards with a force equal to the weight of the volume of water it displaces, that the application point of force is the mass center of the displaced fluid and that the force has value only in a gravitational field, like that of our planet’s, it would have been the first animal to think rationally and would have embarrassed even Archimedes.”

“Aha! So reason helps us think in an abstract manner or ... How shall we distinguish it from intelligence?”

“The intelligence of the beaver, like all living creatures’, operates primarily on the basis of the information received from

the senses. What the intelligence knows to do best is to associate the information received from here, from its direct environment. On solly this type of information is the beaver’s skill based when erecting such an amazing construction meant to defend his den from predators.

But the Great Dictionary of Neologisms of 2000 tells us that, unlike intelligence, reason is ‘*man’s ability to know by operating with notions, judgments, reasons, to penetrate beyond the appearances of things and phenomena*’. So reason is ‘*man’s ability*’ which helps him to go **beyond** what he perceives with the senses.

The problems that reason raises are abstract; they are separated from the immediate reality. For example, an anecdote tells us that Archimedes noticed how, strangely, his body is lighter when it’s submerged in water. The beaver also sees this phenomenon. But Archimedes didn’t stop here. The law he formulated is based on the question raised by reason: ‘Why is this phenomenon happening, what’s hidden beyond it?’ Nobody before Archimedes wondered why when they’re in the water, they feel much lighter than when they are on the ground, and the lack of answer to this problem didn’t affect the earthlings’ life in any way.

Even when he was killed by a Roman soldier’s sword, Archimedes tried to solve, with circles drawn on the sand, a problem that didn’t exist. It didn’t exist as concrete concern for his life with daily worries of the household. Nor did it exist for the lives of his fellow citizens in Syracuse, the inhabitants of Greece, Europe or any other part of the ancient world. Archimedes surpassed by his reason the concrete border, he had passed *beyond*.

Many scholars, such as Pythagoras, Newton, and Einstein, solved many other problems that weren't in the minds of any of their fellow men. These were problems that went far beyond the stage of knowledge in which humanity was at that time.

Reason is based on ordered chains of judgments with which we enter the essence of phenomena. It often leads us to understand processes that go beyond our sensory perception. Thanks to it we succeed in abstracting operations, but we also make useful logical pictures, such as maps, which contain vast territories contoured on tiny surfaces. With the help of reason we learned what reactions are happening in the Sun; we discovered the farthest galaxy and the smallest subatomic particle. All these are *beyond*, and our senses will never be able to detect them directly.

Intelligence knows what is HERE.

Reason wants to know what is BEYOND.

The cooperation between them is admirable and characterizes only the human species.

Reason discovers the laws of nature and, when it's prepared, intelligence takes over information from reason, verifies and certifies it (or not). This process can sometimes take centuries. Based on it, intelligence builds the whole technology, the increasingly complex tools that we use now or that we'll manufacture in the future. Here we can name any instruments, some with which we explore the world (from the microscope to the spacecraft), others with which we increase our comfort or exploit natural resources (from the vacuum cleaner to the marine oil platforms). All were born from the cooperation of intelligence with reason."

"Does this mean that reason helps intelligence evolve?"

"Reason is an instrument with which we discover the world. Intelligence is a quality that develops based on the information it constantly obtains from *here*, through the senses or from *beyond*, with the help of reason."

"But does our reason develop too, like intelligence does?"

"No. Reason is just an **instrument**. It doesn't grow, doesn't develop or regress. It's the tool you use or let rust."

"OK! I got it: animals have no reason; it characterizes only us, humans. But allow me to interrupt you briefly. We were supposed to make a journey outside the universe, to the borders of matter and even beyond them. I thought it would be an adventure, that we would explore new areas. Why are we going round in circles and talk about intelligence and reason?"

"Preparing a trip is one of the keys to success. If you were to get to the end of the world, to the last frontier of matter, what guide would you take with you?"

"One that knows the way."

"Or a guide that can find the way, if the road is unpaved so far. You have two options: intelligence or reason. Which one would you choose to go further with?"

"Aha, so this was the surprise guide. Reason, of course. Because it can take us beyond our living environment. But can it lead us as far as the final frontier of matter?"

"Yes. It's the only tool we can use to get there. We all have it, we only have to use it wisely."

"Good! Now I'm ready to go!"

"Did you put reason in the backpack?"

"I did."

“For the moment, we have no information from which to deduce where the final frontier of matter is. But reason will guide us until there and show us what we find beyond it.”

This term, *beyond*, leads many to think of an area that isn't concerned with our science or intelligence, but it would be an immaterial realm that can be reached by spiritual paths. Is it possible that we can find God beyond the final frontier of matter? We must admit that not only science carries us beyond what our senses signal us is existing in this world. Long before science, religion provided us with information from other worlds where we cannot penetrate either with senses or with the most advanced scientific equipment.

Science considers that a territory of the Divinity does not exist, but religion is absolutely convinced that beyond the domain of matter we can discover God. There are enough conflicts between believers and atheists. The former know with certainty that we're the children of God; the latter don't accept the existence of a Creator who made everything from nothing, and now leads the world from the shadow, at His will. So there's an open question: does God exist?

We'll take into impartial account these two great directions of humanity: science and faith. At the end of the road, we should see which one is right. We'll seriously consider the arguments of atheism and those of religion, but reason will always be our guide. It will be our only support to lead us to the final frontier of matter.”

HERE WE GO!

“We start from the simplest and most exciting questions: What is matter? What is time? What is space? Referring to them, the physicist Leon Lederman, Nobel Prize for Physics in 1988, considers that the periodic reiteration of these problems shows our anxieties in front of the huge universe. All these questions that humanity has been asking for centuries, Lederman tells us, can be reduced to one: ‘If the universe is the answer, what is the question?’ (THE GOD PARTICLE: IF THE UNIVERSE IS THE ANSWER, WHAT IS THE QUESTION?)”

“Very strange! ... This question doesn't ask for an answer, but for another question!”

“To find out the question that replaces the answer, we'll have to go beyond the boundaries of the cosmos. We'll have to look at our universe from *beyond*, as a ‘response’, as Lederman sees it. But what will we find beyond? The problem: ‘What is beyond?’ divided humanity into two sides: believers and atheists.

For the believers, this term, *beyond*, is the realm we, material beings, cannot reach, because there isn't supposed to be anything material. Beyond is the realm of God. Of course, they cannot bring any material evidence to prove the existence of that