

How new discoveries favor a return of God in science leading to a crossroad

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Renowned scientist John Eccles and his wife Helena in True Parents' hotel suite at the Stouffer Concourse Hotel during the 17th International Conference on the Unity of the Sciences in Los Angeles, November 24–27 1988. Bo-hi Pak, seated nearest John Eccles, was interpreting.

After a short introduction about the problems and controversies around this question, I will describe how we could deal with this question in a scientific way. An overview of the birth and evolution of modern science will show us how "chance" became for some a new god and how new discoveries favor a return of God in science leading science to a crossroad at which seemingly opposite viewpoints could open new ways into the future.

The question of the origin of the universe has been a highly controversial matter in the history of modern science. I will just share a few quotations from famous scientists showing how their viewpoints can differ on such a topic.

Eminent scientists weigh in

Albert Einstein (1879–1955) once said, "I want to know how God created the world." However, in response to Napoleon asking him "What about God?" the French scientist Pierre Laplace (1749–1827) would have said, I had no need for that hypothesis. In his book *Chance and Necessity*, Jacques Monod (1910–1926) wrote, "man knows at last that he is alone in the universe's unfeeling immensity, out of which he emerged only by chance." Similarly, Nobel Prize laureate Steven Weinberg (1933–) once declared "The more the universe seems comprehensible, the more it also seems pointless." On the contrary, the famous French chemist Louis Pasteur (1822–1895) declared, "A little science takes you away from God; a lot of science brings you back to God." In his book *God and the New Physics*, the English physicist Paul Davies (1946–) wrote, "In my opinion science offers a surer path to God than religion." We can see through these examples that when faced with the question of the origin of the universe, scientists may not remain rational and objective.

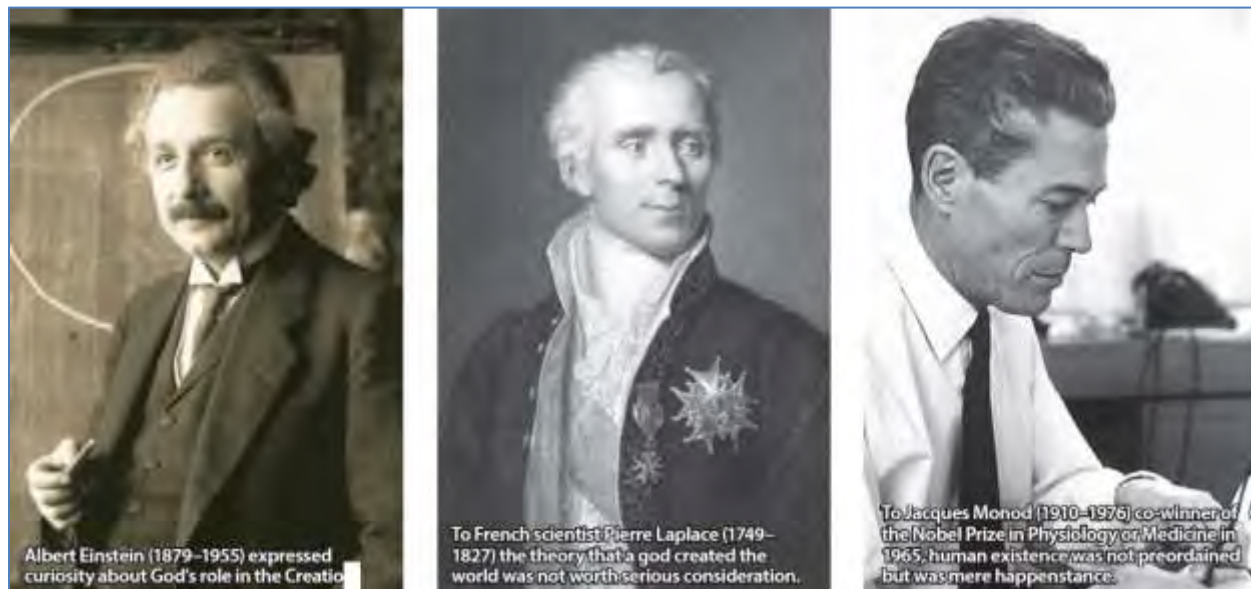
Science, some underlying tenets

I am going to deal with our topic by checking whether the hypothesis of the existence of a creator can be of any use in science. The scientific method is based on the introduction of new hypotheses, from which reality is deduced by verifying their consequences. The hypotheses would be as follows: 1. There is an origin to the universe (A few scientists think that our universe always existed, others think that it began in a multiverse without any beginning or origin.) 2. This origin is a creator, not necessarily a personal God, but at least a creative principle that would include the notions of God envisioned by Albert Einstein or Baruch Spinoza (1632–1677). 3. But it would be something other than the universe itself or its constituents which are space, time energy and matter.

Some people may think that science can answer the question, Does God exist? But we are going to ask

ourselves whether the hypothesis of God or a creative principle can contribute to, or even be necessary for the future development of science. Until now, modern science has largely developed without the notion of God. We will examine why the hypothesis of a creative principle could be fruitful in science.

For example, the Big Bang was a new hypothesis, partly derived from general relativity. Even today, we still have no experimental means of directly verifying the Big Bang. However, if the Big Bang did take place, it had consequences, some of which are still verifiable today. So far, everything fits, although there is still a lot to explain.



The God hypothesis

We will therefore examine the explanatory power of a creative Principle compared with a materialist viewpoint. For a better understanding of the questions that this matter raises, we will have a look at the birth and the development of modern science.

While Asia and the Middle East are the cradle of religion and spirituality, Europe is the cradle of Greek philosophy and modern science; that is, the science that was born with people like Galileo (1564–1642), Newton (1643–1727) and Copernicus (1473–1543). This occurred in parallel with the Renaissance, creating a new age with a profound renewal of science, the arts, literature and philosophy.

That was the moment when science began to fly on its own, clearly detaching itself from philosophy and religion, creating its own validation criteria. Even today, science is still based on the same pillars, one rational and the other experimental. Any scientific explanation must be logical, rational and consistent. But experience must also confirm it. In other words, any theory must be falsifiable or refutable.

Science and religion through the ages

From then until the twentieth century, science and religion were considered as dealing with entirely different fields. This did not prevent resistance from arising, starting with Galileo's problems with the Papacy or later the difficulties created by the theories of Charles Darwin (1809–1882). By the end of the nineteenth century, some scientists were convinced that science's main issues were solved, that the rest was only a question of details and that God was an unnecessary hypothesis.

However, two great scientific revolutions -- namely the theory of relativity and quantum physics -- changed completely the picture of science and blurred the clear barrier between science and spirituality. Starting from the seventeenth century up to the nineteenth century, the different types of knowledge in Europe became independent from the concepts of God and spirituality.

However today, a modern philosopher or theologian can no longer ignore the discoveries of today's science and its philosophical consequences. A modern scientist can no longer ignore spiritual and philosophical concepts whatever his field of activity. The physicist must ask himself what the origin of the universe is. The biologist must reflect on the fundamental nature of life. The neuroscientist must investigate whether the mind is a simple emanation of the brain.

The dilemma of science today

Modern science is based on the principle of the objectivity of nature. We sometimes refer to it as "methodological materialism." It is a basic postulate which expresses that nature is objective and not projective; that is, it has no finality in itself. Another fundamental principle of science is the principle of

causality. Until recently, it meant that the same causes produce the same effects. Due in part to quantum physics, it has taken a more modest form, which is that the effect cannot precede the cause.

Until Darwin, all science was purely deterministic, in other words, the universe was a perfect mechanism. With the nineteenth century, chance started to appear in science in two ways. Darwin introduced the notion of chance with his theory of evolution and statistical laws appeared in the new science of thermodynamics. During the twentieth century, a new form of chance appeared with quantum physics.

The difficulty for science is that the greater the share of chance, the less predictive it can be. Before the birth of modern science, we used the so called "god of the gaps" for everything we couldn't explain rationally. This is why the development of science has led some people to abandon religious beliefs.



Nobel Prize laureate Steven Weinberg (1933–) when asked about human spirituality replied, "I don't even know what it means." Photograph credit: Larry D. Moore CCB BY-SA 3.0 via Wikimedia



French chemist Louis Pasteur (1822–1895): "The more I study nature, the more I stand amazed at the work of the Creator."

Dealing with gaps

Today, "the god of the gaps" is often replaced by a god named "chance." Everything that is not explained by necessity is explained by chance. But there are two kinds of chance: quantum chance, which is well defined scientifically and which generates only a small degree of indeterminism on our scale, and coincidence. They gave birth to a god named "chance." It would be at the origin of the Big Bang and the source of evolution. Why? Because according to the principle of the objectivity of nature, what is not the fruit of pure necessity can only be the result of chance. Therefore it cannot be due to an intention or finality. At least this is what many scientists believe.

But the evolution of the universe from the Big Bang to the present day with the appearance of and the evolution of life and of humanity supposes an extremely improbable avalanche of chance. If we also take into account the fact that the law of increasing entropy implies increasing average disorder. This makes the appearance of structures such as ours even more unlikely, if it is not part of a pre-established plan.

The Big Bang and thermodynamics of the universe

- Second principle of thermodynamics: in all energy exchanges, energy dissipated as heat.
- Energy tends to turn into a disorderly bustle. Degree of disorder: entropy.
- Big Bang, entropy of the universe: zero or extremely low
- Big Bang: a great deal of orderly energy

In addition Fine tuning, the appearance of life and the evolution of the life of human beings and of the brain

The thermodynamics of the universe

According to the second principle of thermodynamics, our universe should move toward increasing disorder and stable equilibrium. However, the opposite is happening, the evolution of the universe is moving towards complexity and the appearance of structures organized by unstable equilibria. This may be why Albert Einstein declared, "The most incomprehensible thing about the world is that it is comprehensible."

I'll express shortly and simply the second principle of thermodynamics: In all energy exchanges, some of

the energy is dissipated as heat. The energy of an isolated system tends to turn into a disorderly bustle. This degree of disorder is measured by entropy. Consequence: If the universe is an isolated system, at the time of the Big Bang, the entropy of the universe was zero or very low. Conclusion: at the time of the Big-Bang, there is a great deal of orderly energy. On top of that, our universe seems to have had a very fine tuning.

The astrophysicist Trinh Xuan Thuan (1948–) explained that the probability that pure chance could have produced it is 1 in 1,060. Therefore, with the advancement of mathematics, statistics and computer science, the god named "chance" will probably not survive for a long time. That is why materialist scientists can only offer the possibility of a multiverse as a reasonable alternative. However, this hypothesis might be more difficult to verify than the hypothesis of a creator.

We have seen that the probability of our universe with its parameters to have appeared by chance is very weak. This is even truer for the appearance of life and the appearance of human beings. Neurosciences are showing the incredible capacity of our brain, about which it is hard to believe that it can only be the result of chance and natural selection. The question of evolution alone would deserve a whole presentation. Let me just say that if evolution is a reality, Darwin's theory alone cannot explain most of it.

The hypothesis of a creative principle

As the French scientist Jean Staune (1963–) says, "God is coming back hard." Some scientists wonder, therefore, if at its birth, the universe did not have a kind of "genetic code" that has been unfolding for fourteen billion years. Doesn't that fall into another "god of the gaps" to assume that the universe follows a plan? No, if we don't settle for that kind of answer. We have to look for and add to it a scientific explanation of the mechanisms that starting from a creative principle leads us to today's world.

And these mechanisms might even enable us to better understand the nature of the creative principle. This is how science could lead to an understanding of the origin of the universe. Let us note here, taboos no longer exist in relation to a creator who would remain intellectually inaccessible and incomprehensible to us. This means that we have to be ready for a concept of God that could be quite different from that of traditional religions. We need new paradigms capable of including the spiritual and scientific side in their explanations.

Science at a crossroad

Now let me suggest what could be the challenges that science is going to face in the twenty-first century. Since antiquity, there has been a philosophical quarrel over the notions of being and becoming. Parmenides (515 BC–?) emphasized the being: "Whatever is is, and what is not, cannot be." Heraclitus (c. 535–475 BC) emphasized becoming: "No man ever steps in the same river twice."

Until the nineteenth century, science followed the path of Parmenides and was based on a completely deterministic and conservative physics. But nowadays, scientists have placed more emphasis on indeterminism, randomness, relativity, incompleteness and irreversibility, thus placing themselves more in line with the philosopher Heraclitus. This is particularly the case with Ilya Prigogine (1917–2003), a Nobel Prize laureate in chemistry.

Incompleteness, Uncertainty, Indeterminacy and Relativity	
Classical Paradigm	New Paradigm
Newton	Einstein
Laplace	Heisenberg
Hilbert	Gödel
Berthelot	Prigogine
Darwin, Dawkins	Denton, Conway-Morris
Crick, Changeux	Eccles, Libet, Sperry

A middle path

My vision is that the world in which we live is a subtle mixture of these two options, which I consider to be complementary and not opposed. The conservative option is found in particular in gravitation that

keeps us -- as well as the water of the oceans and the air of our atmosphere -- firmly on the ground on Earth. Possibly the planet Mars had water and atmosphere on its surface at some point in time, but not enough gravity to keep it. On the other hand, stars with high mass and therefore a strong gravity will finish their lives as black holes.

The notion of verticality introduced by gravitation can be generalized to the concepts of order and hierarchy that govern many relationships such as the parent-child or mind-body relationships. On the other hand, electromagnetism provides a large part of the dynamics and evolution of things. We can talk about "horizontal" relationships that will allow creativity and diversity. These are all yang-yin type of relationships.

It is the subtle balance between these two types of interaction that has brought our universe to what it is today, with the appearance of stars, planets, life and human beings. Let me remark that if we stay firmly on the ground on Earth and do not go through the ground, it is thanks to the electromagnetism counterbalancing gravitation.

A tree is a symbol with the vertical, unidirectional and stable trunk and horizontal, moving branches changing according to the seasons. Another avenue that science must develop, in my opinion, is the equally subtle balance between determinism and indeterminism. I see it as the possible source of our free will. What quantum physics teaches us is that there is indeterminism at the microscopic level, but most of the time it has few effects at the macroscopic level.

What the Nobel Prize laureate Sir John Eccles envisioned is that it is this indeterminism that would make possible the action of our self on our brain. Even if the way he describes this action does not happen to correspond to reality, in the future, I am convinced that the basic idea remains the right one. Indeed, if the laws of the physical world that also apply to our physical body were entirely deterministic, we would only be machines without any autonomy. But if our body and our environment were not subject to any law and behaved in a completely chaotic way, we would have no possibility of control. This balance between determinism and indeterminism also allows a creator to act without violating the laws of nature.

Ways into the future

To conclude, I would like to mention a few other points on which science will surely progress in this century: Bringing together general relativity and quantum physics in a theory that would solve for example the mysteries of dark matter and dark energy. Understanding what Eugene Wigner called "The Unreasonable Effectiveness of Mathematics in the Natural Sciences." Understanding the essence of life -- in his book *The Self and Its Brain*, Sir John Eccles wrote "materialist solutions fail to account for our experienced uniqueness."

This brings me to a final point. Today, based on the so-called principle of the objectivity of nature, science rejects the notion of finality, but if this point of view is not too embarrassing for a physicist, it becomes problematic for a biologist and even more so for a neuroscientist. I believe that science will sooner or later have to abandon this premise and also include spirituality, tackling issues like Near Death Experiences, the mind-brain relationship, placebo effects, hypnosis, water memory, etc. To keep the presentation short I had to oversimplify a few concepts.... In the end, everything is a matter of balance!