Science and Divinities

> IN DIALOGUE WITH NATURE BEST ESSAY AWARD – **SILVER AWARD**

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1. Introduction

Modern science, a field involving vigorous experimentation with falsifiable hypotheses (Popper 9) to generate scientific knowledge for application (Bunge 19-20), is often juxtaposed to religions, which involve faith in untestable or unobservable divinities (National Academy of Sciences 12). Such supernatural entities do not depend on empirical evidence, thus it is widely believed that religions and science contradict and cannot co-exist. However, can divinities play roles in science? Can they be independent yet complementary? In this essay, the possibility of coalescing science with divinities will be discussed, in order to impart a more meaningful representation of the world.

2. Science in Divinities

One possibility of bringing science and divinities together is to investigate whether science can prove the presence of divinities. Due to their unobservable nature, immaterial divinities are often indirectly inferred from natural phenomena, instead of robustly experimented. C.S. Lewis, an English novelist and philosopher, discussed how scientific discoveries suggest the existence of a supernatural designer. He pronounced that the general rules hidden in the complexity of biological systems, such as multi-facetious signal transduction cascades, involves a purposeful design rather than solely random mutations or natural selection (Breitbart 168),

resonating with Poincaré's definition of intellectual beauty – "similarities hidden under apparent discrepancies" (163). The purposes would be the creations of deities as no beings can acquire that much knowledge and wisdom. Therefore, some may argue that the unified laws and theorems brought out by scientific development are signposts of intelligent divinities, instead of purposeless natural processes.

However, this argument is subjected to fallacies. The intangible divinities are assumed to be intelligent, despite the fact that there is no empirical evidence of the divinities' having personalities. Divinities are also assumed to be a necessary condition for intellectual beauty. The existence of intellectual beauty can be due to multiple factors, which may or may not include gods. Hence, divinities may be a *sufficient* condition for intellectual beauty, but not a *necessary* condition. To disprove these fallacies will be a philosophical or religious question beyond the scope of this essay. Consequently, the possibility of co-existence should be viewed from the impacts of religion on science, but not from science to religion.

3. Divinities in Science

Although scientific discoveries cannot prove the existence of divinities, their supernatural power is a tool to explain unknowns. Isaac Newton, the founder of classical physics, attempted to explain planets' orbital motion by inertia. Each planet previously received an unknown force in a direction different to the gravitational attractive force by the sun will result in an orbital motion, whereas the non-imparted planets will be drawn towards the sun (Cohen 61). Newton eventually related the origin of the initial force to an "intelligent Agent" (Boyd). He even went as far as defining space as God's sensorium, or "emanative effect", which was regularly intervened by the Agent to prevent natural processes from going astray (Jacquette 344-370). This incomplete explanation and the reliance on untestable divinities further promoted dissatisfied astrophysicists to develop new theories. The initial momentum of planets leading to orbital motion can be explained by the formation of the Solar System (Jordan), in which collapsing gas clouds spin due to gravity, gaining speed. Newton's sensorium is also later elucidated by theories of dark matter and quantum fields (Skullerud 76).

On the other hand, when unknowns have been explained, divinities are no longer dependent on. Charles Darwin was originally a pious Christian, who never doubted any word in the Bible, and had even considered it as the truth (Darwin 45).

His belief in an omniscient divinity encouraged him to study natural philosophy, thus he later joined the HMS Beagle voyage, during which he garnered biological evidence of organisms evolving in a self-controlled manner, or natural selection, "the preservation of favourable variations and the rejection of injurious variations" (Darwin 74). The slow changes in the structure of organisms over thousands of years improve the fitness in new biotic and abiotic conditions (Darwin 76). His theory made him question the existence of God as he could no longer argue that organisms' variability was His design, and the failure of creationism was marked (Hitchens 94). It is noted that Charles Darwin only refuted the traditional creationism[1] in his younger years. He later offered a modified theological view that God only created one or a few primitive life forms (Cosans 362-371). Now, the emergence of life can be explained by the primordial soup, where random collisions of molecules in water bodies on the early Earth resulted in living systems (Lazcano 2010-2014), with the theory of divinity rejected in the scientific field. This demonstrates divinity as an intermediate step in explaining natural phenomena, capable of arousing scientists' interest and provoking criticism, until a scientific theory is pushed forward with adequate proof.

When evaluating the role of divinities in science, it is important to recognise the negativity of assigning divinities to an overly generalised and non-scientific explanation of mysteries. However, it is the scientific spirit of "seeing is believing" that drives scientists uncomplacent. Divinity is thus a positive stepping stone, or a normal pit stop, instead of a betrayal of empirical science.

In addition to the practical application, the position of morals in applying scientific knowledge can be found in divinities. Joseph Murray, a Nobel laureate, invented organ transplantation with his expertise in physiology and anatomy. Its use and regulations are ascertained by ethics and religious views, and cannot be scientifically quantified. Despite religious advocacy from Pope John Paul II as a service of life and reverence towards the Creator (Cotrau et al. 12-14), it received doubts from Islamic scholars concerning the possibilities of commodification and commercialisation (Mousavi 91-93), as the Islamic God teaches that a human being is not the owner of any part of his body (Bruzzone 1066). The Catholic Church also declined the objectification of organs, only accepting transplantation with the consent of the donor and without excessive risks (Bruzzone 1064-1067). Joseph Murray understood the implications and was aware of their repercussions, such as

1 All life forms were created by God.

organ harvesting and trafficking, compelling him to consult religious leaders about its rightness (Snyder 110). Moreover, whether organ transplantation is right or wrong would be beyond the scope, but assuming that scientific development is by itself neutral, it is still subjected to maleficent abuse. The involvement of religious bodies in science and bioethics can minimise the risks.

Rachel Carson has further elaborated on the morality of scientific inventions. It is necessary to provide sufficient grassland for grazing, or to remove roadside vegetation which obstructs drivers' vision; the problem lies in the destructive use of synthetic herbicides. The extensive and pre-emptive use of toxic chemicals destabilises the food web, eradicates the natural aesthetics and takes its toll on the agricultural economy (Carson 144-149). She reasoned that selective spraying and biological control would be better alternatives, bringing a long-term control whilst minimising unfavourable side-effects on the ecosystem (Carson 150, 155). Being a devout Presbyterian, she believed that mankind's arrogance in technology and science, unless scrutinised spiritually and ethically, would destroy the beauty of the earth by overriding the values of God ("Faith, Science & Action"). Her emphasis on humanitarianism and protecting God's creations formed the basis of her book *Silent Spring*, which uncovers how men condemn undesirable natural objects to destruction without full awareness of the consequences (Carson 141). It is the spiritual humility that guides her scientific research. Hence, divine doctrines of numerous religions can act as a moral compass to guide not just the development of scientific knowledge, but also its applications.

Nevertheless, no religions can be viewed as the definition of morality in science, as their creeds differ and the ultimate "good" is yet open for discussion. Divinities are solely a placeholder of morality, providing moral and mental comfort for making a more peaceful world.

4. Independency and Complementarity of Science and Divinities

In the above section, the roles of divinities in science have been briefly explored, hinting that divinities and science can co-exist. The major conflict between the two is the unfalsifiability of divinities, which is apparently in opposition to the principle of falsifiability in science. It would be impossible to resolve this fundamental difference between the physical and ethereal domains, and thus meaningless to contemplate this issue. Putting aside falsifiability, science and divinities then provide divergent interpretations of the world – the former mechanistic, and the

latter teleological. It is remarked that the divergence only applies to the discourse about the physical world, as science cannot provide an interpretation to the spiritual world or divine miracles defying the laws of physics. Science yields explanations for how the divergence of character and rarity lead to the extinction of species (Darwin 83-87), how DNA is replicated and hereditary information is passed to offspring (Watson 137-138), or how emotions are processed consciously and unconsciously (Kandel 189-190). Divinities such as the Christian God offer plans to employ the divine faculty of reason, such as all lives are God's beautiful gifts (McFadden 1), and God is intelligent and He designs universal laws to allow harmony and order (Corey 6-7).

In other words, scientific method is only limited to objectively quantifying or qualifying results in order to deduce laws and theorems, but fails to satisfy teleological concerns: what is the purpose of having Newton's laws? What is the purpose of the Big Bang? On the other hand, divinities subjectively suggest the purpose of the world, all beings and the scientific mechanisms, but are insufficient to give logical or testable explanations to physical phenomena: how do Newton's laws govern projectile motion? How did Big Bang occur?

It is now evident that the divergent interpretations can find a common place, or converge to complement each other's demerits and limitations. An outstanding scientist can be a dedicated believer; a dedicated believer can also be an outstanding scientist. Science satisfies men's curiosity; divinities fulfil men's psychological and emotional needs. Only when logos and ethos come together can men truly understand themselves and the surroundings.

5. Conclusion

Although science is examined with reasoning and evidence whereas divinities are governed by faith, the exploration of the spiritual world with the heart and mind can co-exist with the empirical, tangible scientific world. Science can be used to reflect upon religious beliefs, while religions can be used to reflect upon the morality of science, or even motivate scientific pursuits through the manifestation of inherent beauty. To understand the world, neither objectivity nor subjectivity alone serves a greater purpose. The coalescence of science and divinities forms a more concrete depiction of oneself and the world.

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Teachers' Comments

/ CHEUNG HANG CHEONG DEREK

Have you ever wondered if an eminent scientist can also be a true believer in divinity? Science and religion are two seemingly contradictory approaches to understanding nature. The author provided insightful analysis on the role of divinities in scientific development and as moral guidance in technological advancement. This paper also leads us to reflect on whether science and divinities' coalescence could possibly contribute to a more complete human understanding of nature.

/ WONG WING HUNG

Science and religion are both edifices of human knowledge and experience. Researchers have paid a lot of efforts to study the intricate relation between them. Different topics reveal different facets of the relation. According to Ian Barbour, those facets can be categorized into four types, namely conflict, independence, dialogue and integration. In this essay, the author attempts to argue for the independent relation between science and religion. The essay presents a convincing argument. Strong evidence and good examples are provided to show that science is about natural phenomena and their descriptions, while religion is about values. Science and religion therefore belong to different spheres of human knowledge and experience that they are independent of and also complementary to each other.

/ HO WAI MING

According to Kant, one has to limit the validity of knowledge "in order to make room for faith". Chi Ngai's paper on science and divinities in some sense follows Kant's advice.