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A SPIRITUALITY FOR SCIENTISTS

Historical Overview

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NOWADAYS IT IS A COMMON ASSUMPTION that scientific work entails an 'atheistic methodology'. Although somewhat provocative, this formula expresses what the Second Vatican Council called the rightful 'autonomy of earthly affairs'.[1] The scientific investigator is free to construct any scenario likely to explain phenomena without needing to have recourse to some 'supernatural' element which would intervene as a special complement to a series of 'natural' causes.

Such an attitude is justified not as an example of tolerance which avoids challenging modern secularisation, but as the outcome of a reasoned theology of creation. The act of creation consists in handing over to creatures 'their own stability, truth, goodness, proper laws and order'.[2] Thus, according to their 'species', each acquires the capacity to move by its own power and to enjoy a certain autonomy from the environment; in the case of the human species, this takes the form of freedom. On this understanding, the intellectual process of knowing belongs to a different order from the personal choice of faith, which involves liberty.[3]

Such an outlook helps to explain why, from the early development of modern science at the start of the seventeenth century, the attitudes of scientists to religion have been very diverse. There are those who deliberately separate science from the quest for meaning, either because they set aside the latter as without interest, or because they consider the two tasks to be unrelated. However, today such attitudes—which could vary from indifference to a prudent distancing—are less common than

[1] *Gaudium et spes*, n. 36.
[2] *Gaudium et spes*, n. 36.
[3] See *Le savant et la foi*, edited by Jean Delumeau (Paris: Flammarion, 1989), 37.

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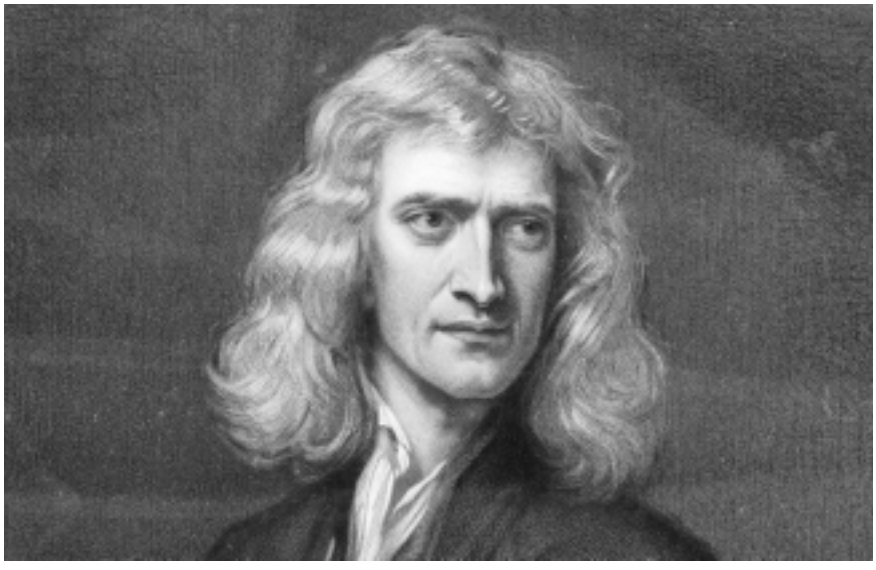
they used to be. Advances in science, particularly in the domain of bioscience, raise questions about human destiny—about what it is to be properly 'human'. These are questions which the positivistic approach had resolutely ruled out as irrelevant, given that there was only one enterprise worth undertaking—the investigation of scientific truth.

In this article, I would like, with the help of a number of significant figures, to distance myself historically from today's attitude to the 'spirituality of scientists'. Clearly these figures are special cases, but their influence, extending beyond the limits of the scientific world, shows that their ideas are in harmony with the preoccupations of many. We will consider in succession: Isaac Newton, Charles Darwin, Albert Einstein and Pierre Teilhard de Chardin.

Divine Sovereignty: Isaac Newton

Newton is not the founder of modern science, but he is the man who brought to perfection a world system conceived by his great predecessors: Copernicus, Galileo, Kepler. His work was to complete, to a large extent, the unification of the universe begun in the century before him. By showing how the movements of the planets obey a law of gravity which can be observed on earth, he established a general law that allows one to understand the structure of the cosmos.

However, the work of Newton was not limited to the field of scientific knowledge. It went along with a spiritual search that aimed



Sir Isaac Newton

at glorifying the divine activity—and this at a time when society set little store by religion. From Newton's point of view, the contemplation of cosmic order was the surest way to arrive at knowledge of a divinity whom religions, divided among themselves, were failing to reflect.

Newton's principal work, the *Principia mathematica philosophiae naturalis* ('Mathematical principles of natural philosophy') ended, from its second edition (1713) onwards, with a 'General Scholion'. This is, in effect, a conclusion that brings into focus the author's natural theology, which had remained implicit in the rest of his work. Far from being a simple appendix, the *scholion* helps one to understand the overall aim of the Newtonian project. The author declares that:

> This most elegant system of the sun, planets, and comets could not have arisen without the design and dominion of an intelligent and powerful being …. He rules all things, not as the world soul but as the lord of all.[4]

The emphasis here is on the order of the world. The cosmos is a harmonious ensemble, of which God is both the source and the guarantee. The image frequently used at this period is that of the clock. The regularity of clockwork seems to reflect that of the heavenly bodies, which are themselves the ideal parallel for worldly phenomena. As in the ancient scientific systems, the heavens are the origin of all movement. But the difference now is that the regularity seen above is presumed to apply to all that happens below and, despite appearances, earthly phenomena are thought to obey mathematical laws.

For the followers of Newton, God is both the designer and producer of the clock, and also the one responsible, by means of 'providence', for its proper working. Divine omnipotence is visibly manifested in the very structure of the world. Hence words suggesting sovereignty (like *dominus*, *dominium*, *dominatio*) are frequent in the text. Such a vocabulary excludes any pantheistic interpretation of Newton's theology, despite the presence of certain elements in his physics that seem to point in that direction.

Nevertheless, the way in which God shows Godself remains mysterious. Newton's insistence that the action of God displays itself in a necessarily cogent manner goes alongside his refusal to define what

[4] Isaac Newton, *The Principia*, translated by I. Bernard Cohen and Anne Whitman (Berkeley: U. of California P, 1999), 940.

this ultimate cause really is. One of the paradoxical aspects of Newtonian mechanics is that he wanted to maintain the action of God in nature while, in the long run, providing support to those who were promoting a radically secular vision of the universe.[5] For Newton, the divine essence remains unknowable. One arrives at the knowledge of God only by an inductive argument based on the effects of God's action. God's substance remains for ever beyond human reach. From this point of view, Newton's theology is deeply agnostic.[6] There is a contrast between the transparency of the world, thanks to the simple laws that unify it, and the opaque darkness of 'the hidden God'. One has to acknowledge that God has not revealed everything to the human race, and that God's omniscience cannot be fully shared, even if we are able to participate in it to some extent. An insurmountable barrier separates the world that can be known by us (which includes knowledge of the celestial spheres) from the world of the divinity.

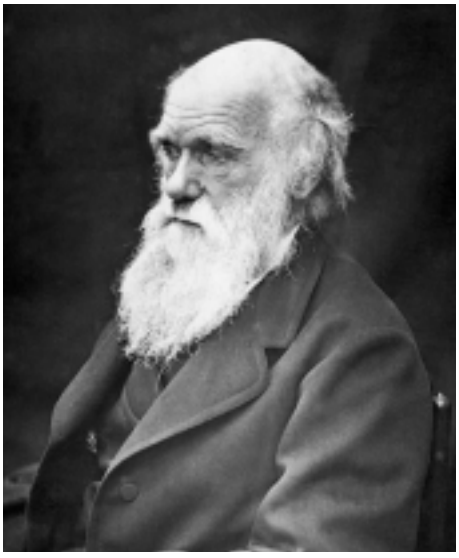
This sharp duality entails certain theological consequences. It prevents Newton from giving credit to the theological doctrine of the incarnation: if God reveals Godself in the world—as happens everywhere—it makes no sense for God to become incarnate in one particular figure who is part of that world. Jesus can be accepted as an exceptional human person who manifests by his actions a certain relationship with God. One may call him 'divine' if one wants to indicate that Jesus shares in the almighty power of creation, but it is not possible to speak in strict terms of a hypostatic union.

From William Paley to Charles Darwin

The Newtonian model is adapted primarily to the physical world. In his day, the living world seemed far too complex for the application of mathematical laws. However, this idea gradually gathered speed. At the end of the eighteenth century, an Anglican theologian, William Paley, undertook a sort of extension of Newton's theology to include living organisms. Here also it is the image of the clock that served as guide. Living organisms are such well-ordered systems that any study of them must lead to the notion of the 'intelligent designer'. For Paley, the contemplation of these beings discloses such a powerful harmony

[5] See John H. Brooke, *Science and Religion* (Cambridge: Cambridge UP, 1991), 118.
[6] See Richard Snobelen, '"God of Gods and Lord of Lords": The Theology of Isaac Newton's General Scholium to the *Principia*', *Osiris*, 16 (2001), 169–208.

that it invites one to an amazed wonder which transforms itself into sheer thanksgiving to the Creator: 'The world thenceforth becomes a temple, and life itself one continuous act of adoration'.[7]



Charles Darwin

The contemplation of nature, when guided by the eye of science, gives birth to a religious feeling. In Paley's account, the apparent disorder that holds sway among biological phenomena assumes the appearance of order when one realises that each organism is adapting to its environment, or each bodily part fitting in with the requirements of the whole to which it belongs. The key concept is that of system or of an ordered structure. This presupposes a mighty power which created the order; it seems unthinkable that the world has come about through self-creation. A primary cause is necessary for it. The existence of order always points to choice; only a personal power is capable of producing an orderly structure.[8]

> Even the presence of faults does not invalidate the idea of a global order: when we are inquiring simply after the *existence* of an intelligent Creator, imperfections, inaccuracy, liability to disorder, occasional irregularities, may subsist in a considerable degree, without inducing any doubt into the question; just as a watch may frequently go wrong … without the smallest ground of suspicion from thence arising that it was not a watch; not made; or not made for the purpose ascribed to it.[9]

Indeed, at a certain level, from what might be called the 'divine point of view', there is a harmony of the whole that outweighs errors of

[7] William Paley, *Natural Theology or Evidences of the Existence and Attributes of the Deity*, new edition (London: A. K. Newman and Co., 1817), 460.
[8] Paley, *Natural Theology*, 379.
[9] Paley, *Natural Theology*, 52.

detail. This wish to bring everything into a global harmony does seem to downplay, if not deny, the presence of suffering; there is an apparent reluctance to face squarely the dramatic character of world history. John Brooke described the universe envisaged by the Revd Paley as 'a vicarage garden'.[10] It is a picture that Darwin will refuse to accept.

However, this vision of Paley has an attractive grandeur, which will initially beguile the young Charles Darwin as a Cambridge undergraduate. Only when he comes to develop his own theories will Darwin draw a picture of the living world that is radically different from that of the theologian. For Darwin, the dominant feature is no longer a static harmony but a process, which lacks precision and which, for the most part, defies predictability. The discovery of the mechanism of evolution cancels out 'the old argument of a design in nature'.[11]

There can be no doubt that Darwin is fascinated by nature. His voyage round the world in the *Beagle* puts him in contact with very varied natural environments. His experience of tropical forests is decisive in the formation of his conception of the living world. He acknowledges how troubling he finds his encounter with the forces that render insignificant 'the puny efforts of man'.[12] For Darwin, unlike Paley, it is no longer the harmony that impresses, but rather the competition, the struggle for life. Shortly before undertaking his major work, *On the Origin of Species*, Darwin wrote to his friend Joseph Hooker: 'What a book a devil's chaplain might write on the clumsy, wasteful, blundering, low, and horribly cruel works of nature!'[13] Towards the end of his life he wrote: 'it revolts our understanding to suppose that his [God's] benevolence is not unbounded, for what advantage can there be in the sufferings of millions of the lower animals throughout almost endless time?'[14]

A Cosmic Religion: Albert Einstein

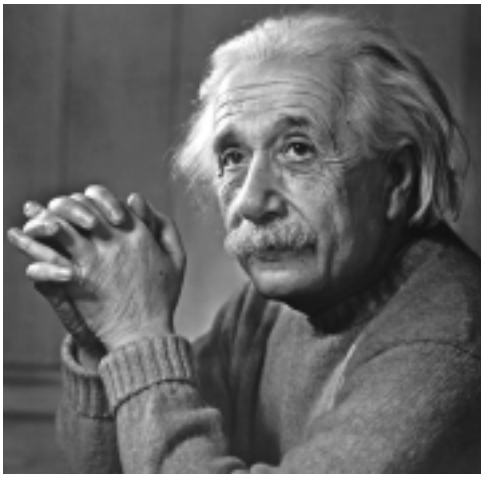
Turning to Albert Einstein, we find ourselves once more with the physical universe, but not quite that of Newton. The image of the

[10] Paley, *Natural Theology*, 198.
[11] *The Autobiography of Charles Darwin 1809–1882*, edited by Nora Barlow (New York and London: Norton, 1958), 87.
[12] Quoted in Adrian Desmond and James Moore, *Darwin* (New York: Norton, 1991), 191.
[13] Letter, 13 July 1856, in *More Letters of Charles Darwin* (London: John Murray, 1903), volume 1, 94.
[14] *Autobiography of Charles Darwin*, 90.

cosmos that Einstein proposes in the light of his theories is less familiar. And yet his purpose is similar to that of his English predecessor: the unification of the principal factors making up the world.

For Einstein this unifying vision has a religious dimension. While his own roots were Jewish, he did not claim any particular religious affiliation. Even if his overall religious outlook may seem limited, it is marked by a number of significant features. Einstein distinguishes three stages in the development of humanity: (1) in a *primitive* stage humans beings are dominated by the fear of a transcendent force; (2) next comes a *moral* stage, which he associates with the Bible, freeing people from the fear but keeping the idea of God who rewards and punishes; (3) then follows a *cosmic* stage—the ideal stage for Einstein—which allows us to have access to the 'contemplative exaltation' that marks the origin of art and science.

Initially, there is admiration for the harmonious structure of the laws of nature. Einstein refers quite frequently to his wonder at the way the world functions. This remains a mystery, impenetrable for the human mind, even if some part can be glimpsed (he rejects complete scepticism). The sense of mystery has an explicitly religious dimension: 'Veneration for that force—quite apart from anything that we can understand—constitutes my religion'.[15] Before such a force, which surpasses all that is human, there is born in the heart of the searcher a sense of both wonder and humility.



Albert Einstein

This contemplation of cosmic order is accompanied by a more pessimistic vision of human nature. Cosmic religion would aim to free humanity from its egoism and from its degrading passions, in order to allow it full communion with the universe.

[15] From a 1927 conversation quoted in Max Jammer, *Einstein and Religion* (Princeton: Princeton UP, 1999), 39–40.

> One of the strongest motives that lead men to art and science is escape from everyday life with its painful crudity and hopeless dreariness, from the fetters of one's own ever shifting desires.[16]

The permanence of the cosmic order allows one to rest from the ephemeral flux of human desires and from the violence of a historical process which evades any attempt to control its twists and turns.

Einstein's God does not have personal characteristics. He went so far as to conclude a conference given in November 1940 with the words: 'the main source of the present-day conflicts between the spheres of religion and science lies in the concept of a personal God'.[17] One has to accept that his religious position is based on a strong denial of any anthropomorphic conception of God. More precisely, the God Einstein rejects is one made in the image of man—a human nature which he sees as essentially egoistic, focused inwardly on itself or its group. His refusal of an anthropomorphic God is the rejection of a God made to suit human needs, a God from whom one expects rewards or punishments. Quite rightly, Jammer has linked this turning away from an anthropomorphic divinity with the proscription of images that characterizes the biblical approach to God (Exodus 20:4).[18]

Pierre Teilhard de Chardin

Is it possible to evangelize the 'cosmic religion' of Einstein, his sensitivity to the presence of the divine in the universe? Such a question invites us to turn to a fourth figure, one who follows on from Darwin and Einstein, and attempts to find some coherence between the Christian faith and discoveries in the area covered by the sciences of living organisms.

In his early writings Teilhard recognises the presence of the divine in the cosmos. One of the first texts of his to be published, *La vie cosmique* ('Cosmic Life'), written in 1916, bears witness to his 'impassioned vision of the Earth', his 'love of matter and life', which he seeks to bring into harmony with 'the unique adoration of the only absolute and definitive Godhead'.[19] Human beings belong in every fibre of their

[16] *Ideas and Opinions by Albert Einstein*, based on *Mein Weltbild*, edited by Carl Seelig (New York: Condor Books, 1954), 225.
[17] Quoted in Jammer, *Einstein and Religion*, 94–95.
[18] Jammer, *Einstein and Religion*, 143.
[19] Teilhard de Chardin, *Writings in Time of War*, translated by René Hague (New York: Harper and Row, 1968), 14.

being to the ensemble that makes up the cosmos. Scientific work brings about in the researcher an expansion of the entire being to the dimensions of the world itself.

Teilhard does not hesitate to speak in this context of 'pantheism'. He is well aware of the distinction normally made between pantheism and Christianity, the latter insisting upon the transcendence of God *vis-à-vis* the world in order to distinguish itself from the former, emphasizing the essential difference between the Creator and the creatures. Yet Teilhard's instinct leads him rather to look for a convergence, 'by bringing out what one might call the Christian soul of pantheism or the pantheist aspect of Christianity'.[20] Within the human soul there is an urge towards totality: by being brought together all things become one. For Teilhard, evil lies in multiplicity and goodness in communion.

This preoccupation with the All appears to Teilhard to be something fundamentally religious. However, the legitimate aspiration to universal communion can find its essence and fulfilment only in the personal figure of Christ. It is here that Teilhard parts company with classical pantheism and with the cosmic religion of Einstein. There is no need to reject the personal dimension in order to attain the pure core of religious feeling. The originality of Teilhard consists in his notion that Christ is not something superimposed from outside on a structure that already has, on its own, a consistency peculiar to itself. There is no question of Teilhard trying to invent some sort of 'Christian science'. He recognises that scientific research has its own autonomy. Thus, his scientific publications, such as *Le phénomène humain* ('The Human Phenomenon') and *Le groupe zoologique humain* ('Man's Place in Nature') deal with data that can be investigated by both believers and unbelievers. But his point is that one will miss the deepest meaning if one forgets that the history of the world, as outlined by scientists, allows one to intuit at its core a certain presence that gives dynamism to the whole process.

In the thought of Teilhard, the human person is the key element. Far from reducing the person to a mere natural constituent of a physical and chemical fabric, Teilhard believes that it is the person who gives meaning to the whole cosmic process. And Christ, the perfect human being, stands as the final outcome of this history.

[20] Teilhard de Chardin, 'Pantheism and Christianity', in *Christianity and Evolution* (New York: Harcourt, 1974), 59.

Do these four figures discussed here possess a certain coherence? It is always dangerous to compare persons drawn from different centuries. However, the intention here is not to extract a spirituality proper to scientists, nor to prove that science leads to God. Instead it has been to illustrate how the scientific adventure of today can find an echo in Christian spirituality. I would like to emphasize three points:

- The first point concerns the contribution of anthropology: is 'the human' simply one element in the complexity of nature, or does it, by its freedom, constitute a 'spiritual centre' that serves to unlock the meaning of nature? Modern science swings between these two poles, tending towards a cosmic spirituality that plays down the importance of the human, a position that Christianity has to reject.
- The second invites us to discover anew the cosmic dimension of the Christian faith. Its starting position may well be that of Einstein—a sense of wonder before the cosmos. It becomes aware of the Holy Spirit discreetly at work in the world.
- The third point serves to qualify the second by accepting an aspect of Darwin's vision, with its greater sensitivity to the real suffering of so many living things; it has no desire to evade reality by focusing exclusively on the regularity of celestial laws. One might cite here the enigmatic 'groaning in travail' (Romans 8:22) that Paul finds in the whole creation. If Christ is the crown of creation, it is on the cross that he displays his definitive victory over the forces of death.

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