# Teilhard de Chardin's Evolutionary Natural Theology

# Teilhard de Chardin's Evolutionary Natural Theology

Author note

David Grumett is a Research Fellow in the Department of Theology, University of Exeter, Amory Building, Rennes Drive, Exeter, EX4 4RJ, UK; e-mail d.j.grumett@exeter.ac.uk. He is author of *Teilhard de Chardin: Theology, Humanity and Cosmos*, Leuven: Peeters, 2005.

Keywords: complexity; convergence; Conway Morris; creation; Darwin; evolution; Fall; incarnation; invention; Jeans; Jesus Christ; matter; Moltmann; Lamarck; Omega; Paul; red shift; selection; technology; Teilhard de Chardin; theology.

Teilhard de Chardin's Evolutionary Natural Theology


## Abstract

Pierre Teilhard de Chardin develops, as is well-known, a model of evolution as a convergent progression from primordial multiplicity, through increasing degrees of complexity, towards a final Omega point of spiritual consummation. (i) This article explores how Teilhard fuses Darwinian and Lamarckian theories of evolution in developing his own, and in particular his defence of the view that Lamarckism is fundamental to a proper understanding of evolution's human phase. (ii) The article demonstrates how Teilhard's scientific interpretation of evolution is inspired by Christian cosmological insights derived from patristic theology and contemporary Pauline scholarship and cannot be separated from them. (iii) His integration of science and theology provides the basis for a renewed evolutionary natural theology which supplants the traditional static models developed by William Paley and others. (iv) Teilhard's natural theology also provides a framework for theological ethical reflection on how humanity should act in its capacity as a created co-creator with God. (v) In later work, he considers the implications of his evolutionary theology for the wider universe. (vi) Teilhard thus presents an invigorated natural theology grounded in evolution that confirms and completes a dynamic and teleological view of the cosmos.


During his time teaching geology and paleontology at the Institut Catholique in Paris, Pierre Teilhard de Chardin complained: "Too many evolutionists have, in fact, committed the serious mistake of taking their scientific explanation of life for a metaphysical solution of the world... Zoologists have imagined that they have rendered the primal cause useless because they were discovering a little more clearly the general structure of its work." (Teilhard

[1921] 1966a, 22–23) His response is not, however, to oppose materialist cosmology with a simple creationist or intelligent design view of the world. After the so-called "Monkey Trial" in Tennessee—which followed the enactment of the Butler Law early in 1925 prohibiting the teaching of evolution in schools—he protested that the case displayed a tendency to regard evolutionary theory as immoral because "in the name of natural selection it first justifies and then teaches a selfish struggle, the precedence of force over right" (Teilhard [1926] 1966a, 136).[1] His point is that the evolutionary process, once correctly understood, itself provides evidence supporting the proposition that the world is intelligently designed.

Darwin, Lamarck and Teilhard

Many prominent theological commentators on Teilhard's evolutionary cosmology have supposed that he embraces a purely Darwinian, or even neo-Darwinian, notion of evolutionary change. Jürgen Moltmann, for instance, bases his critique of Teilhard on the association of evolution with selection, asserting that "evolution always means *selection*" and the survival of the "most effective and the most adaptable" of beings (Moltmann 1990, 294). Teilhard in fact argues specifically against this equation of evolution with Darwinian selection, promoting another evolutionary theory to complement the Darwinian one. Darwin's ideas were, at the dawn of the twentieth century, famous throughout the Anglo-Saxon world, but became widely disseminated in France only during the controversies which followed the publication of Bergson's *Creative Evolution* in 1907 (Farber 1999, 84–97). Even then, Darwinism was never accepted in France as fully as in the English-speaking world, Russia or Germany. The true context for Teilhard's study of evolution is not Darwinian, but Lamarckian (Roberts 2000, 115–118). Jean Baptiste Pierre Antoine de Monet, Comte de Lamarck, the Napoleonic deist heralded at the base of his statue in the

Jardin des Plantes in Paris as « Fondateur de la Doctrine de l'Évolution », argued that all organic evolutionary change is governed by a primordial *sentiment intérieure* situated within an overarching teleology provided by a universal power which orders the universe (Lamarck [1809] 1984). These immanentist notions appeared to many of his contemporaries as a sceptical challenge to the natural theology of William Paley and the English deists, who believed that divine providence was necessarily expressed by a static universe whose creation was complete.

The origins of Lamarck's theory of evolution are, however, broadly identifiable as elements of Aristotelian and scholastic natural law theory (Sloan 1999, 52–83). Lamarck adopted and modified the cosmology of Charles Bonnet, which posited a ubiquitous force penetrating and animating all matter in the universe and conserving it by a process of continuous creation, sustained by a God who is the cause of all motion (Bonnet 1783, sec. VI.ii, I:262–65; sec. XVII.ii, II:174–78). Lamarck asserts:

> We cannot conceive the production of … the presence and continuance of the movements constituting active life, unless we imagine a special exciting cause of these movements, a force which animates the organs, controls the activities and all the organic functions,—a spring, in short, of which the permanent though variable tension is the driving energy of all vital movements. (Lamarck [1809] 1984, 211)

Lamarck, as has already been suggested, did not himself develop a specifically theological cosmology, being an inheritor of the strict separationist view of the relation between nature and God which had persisted through the long era in France when high scholasticism reigned supreme.[2] In a curious way, however, his cosmology was no less "religious" than that of his deist theological contemporaries in England, as neither perceived any need to present an account of continuing divine action on the material world.

Teilhard makes explicit the theological implications of Lamarckism in order to compensate the deficiencies he finds in Darwinism. The clear contrasts he identifies between Lamarckian evolution and its Anglo-Saxon equivalent first need to be noted. Darwin had believed humanity's external natural environment to be the fundamental factor determining its evolution, whose dynamic consists, in Teilhard's words, in the "automatic selection of the more stable (or progressive) groupings among the immense number of combinations fortuitously and incessantly produced in Nature." "Automatic" selection implies that evolution is externally governed and operates randomly, thus generating outcomes that statistical laws are able to predict. Lamarck maintained, in contrast, that the internal motivation of beings performs a decisive function in their evolution, which is "being conceived and ensued by psychic forces analogous to our human power of invention" (Teilhard [1947] 1964, 199). In other words, evolution is not governed by solely external factors, being a partly intentional process and not an entirely random one.

The positive achievement of both Lamarck and Darwin was to free natural history from the "cold, abstract Linnaean categories" which classified a fixed order of species by observing the external appearance of their members. Nevertheless, Teilhard asserts, the theories of both men contain a "great deal of defective explanation and false philosophy." In particular, neither includes in its explanation a primal transcendent cause of material existence or evolutionary change (Teilhard [1925; 1921] 1966, 81, 7, 25). Darwinian theory suffers, however, from an additional serious shortcoming, which is its concept of the "survival of the fittest." This suggests, on the basis of observation of the natural world, that the beings which survive will be the ones best fitted to their environment. Teilhard criticizes this hypothesis on the grounds that it presupposes a "*tenacious sense of conservation*, of survival" for which random processes alone are not able to account (Teilhard [1950] 1978a, 233–34). The notion of survival fails to provide a convincing explanation of the desire of

beings, and especially human beings, to persist in being and develop greater organic complexity, which Teilhard often describes as a "zest for life." He accepts that, among the human species, natural selection remains the dominant motivating force of evolution. Selection is nevertheless complemented by the power of what he calls *invention*. A purely biological theory of evolution which allows no place for this spiritual initiative "diminishes" and "dethrones" humanity by failing to account for the power inherent in specifically human evolution (Teilhard [1952, 1950] 1964, 298, 293). Inventive capacity is, as I will later explain, ever more clearly manifested in modern technological achievements which are enabling humanity to take control of its own evolution and that of the world as a whole.

Teilhard's critique of Darwinism could be challenged on the grounds that Teilhard fails to recognize the extent to which Darwin himself comes to accept his indebtedness to Lamarck. Teilhard, in common with many of his most trenchant modern critics like Peter Medawar and Stephen Jay Gould, accepts uncritically the classic view of Darwin as defending the view that selection by external natural processes provides a comprehensive and sufficient explanation of evolutionary change. In fact, Darwin acknowledged the pioneering work of the "justly-celebrated naturalist" Lamarck on the descent of species, including the human species, from other non-human species, in his preface to the third edition of the *Origin* (Darwin [1859] 1964, xiii). It is particularly notable that the concept of "pangenesis"—which refers to the tendency of biological life to create new forms by means of inherited characteristics, generated internally and independent of external selection pressures—recurs in Darwin's works. This lends weight to the suggestion that he never effected a complete break from Lamarckism (Darwin 1899, II:349–99; 1871, 502–503; Hodge 1985, 207–244). Close to the opening of the *Descent of Man*, Darwin accepts Lamarck's opinion that acquired characteristics are axiomatic to evolutionary theory, stating peremptorily: "I have elsewhere so fully discussed the subject of Inheritance, that I need here add hardly anything." (Darwin

1882, 27) He does, in fact, spend the next twenty pages expounding the importance of inheritance to evolutionary theory.

Teilhard does not pursue his own critique of Darwinism via this revisionist route. In fact, he emphasizes Darwinism's distinctiveness from Lamarckism, arguing that the principal distinction in evolutionary theory is between the external transformation of species by natural selection, and their internal transformation resulting from invention (Teilhard [1950] 1974, 203). He believes strongly that the human phase of evolution is qualitatively different from anything that has preceded it on the grounds that humanity, a spiritual being as well as a material one, is able to direct evolution. He therefore connects Lamarck's *sentiment intérieure* with the advent of self-conscious human life and the stages of evolution preparatory to this.

Teilhard elucidates the relation between the two evolutionary theories in an important footnote in *The Human Phenomenon* in defence of his hypothesis that modern evolution possesses a "fundamental impetus." This digression should be quoted in its entirety:

> There inevitably will be those who, in one aspect or another of the following explanation, manage to find the thought too Lamarckian (with exaggerated emphasis on the influence of the "inside" on the organic arrangement of bodies). But the fact should not be overlooked that I have left a fundamental part in the "morphogenic" action of instinct, as I understand it here, to the (Darwinian) play of external forces and chance. Life proceeds not only by strokes of luck, but by strokes of luck that are recognized and grasped, that is, psychically selected (as I have shown above). Understood correctly, Neo-Lamarckian "antichance" is not merely the negation, but on the contrary, the utilization of Darwinian chance. There is a function of complementarity between the two factors—a "symbiosis," one might say.

> Let me add only that as soon as we allow a place for the fundamental (although seldom observed) distinction between a biology of small and of large complexes (just as we have a physics of the infinitesimal and of the immense), we notice there is reason to separate out two major zones in the unity of the organized world and to treat them in different ways: with, on the one hand, (a) the (Lamarckian) zone of very large complexes (above all, the human being), where antichance visibly predominates; and, on the other, (b) the (Darwinian) zone of small complexes (lower living things), where the only way this same antichance can still be perceived beneath the veil of chance is by reason or conjecture, that is, indirectly. (Teilhard [1940] 2003a, 97–98n)

Teilhard later employs "Lamarckian evolution" as a synonym for "human evolution," in which "biological evolution, from being passive, becomes active in the pursuit of its purpose" (Teilhard [1950] 1974, 203). He does not mean to argue however, whether here or elsewhere, that evolution is entirely purposive: this would amount to a denial of the role in evolution of unconscious growth and the other forms of passivity over which humanity has no control (Haught 2005, 5–20). Rather, evolution is the outcome of the shifting combination of a selective external principle with an inventive inner one. Teilhard describes these dual principles of specifically human evolution as *le dedans* (the "inside" or "within") and *le dehors* (the "outside" or "without").[3] In the coexistence of the two tendencies in human evolution, external selection dominates interior invention, which despite its apparent inferiority to selection nevertheless comes to assume decisive importance. Reflecting on selection, Teilhard states:

> Compared with this immense passive field (the Darwinian) it may seem that the (Lamarckian) ground gained by our inventive efforts amounts to very little. But let us make no mistake about it. However slight the growth may be, however small the seed,

> it is precisely here that the power of renewal and rebounding of the living world is concentrated. (Teilhard [1950] 1974, 201)

Invention by no means liberates humanity from its dependence on random selective processes. It does, however, offer to humankind the means of intervening in and harnessing those processes in order to promote its own flourishing. In due course, I will consider a practical example of how this may occur. I now wish, in the remainder of the article, to consider the theological implications of this cosmology as Teilhard expounds them in relation to the different stages of the evolutionary process.

## Primordial Multiplicity and the Fall into Complex Being

Teilhard's evolutionary cosmology is often presumed to apply solely to the planet Earth, and not to the wider universe. In fact, during the final decade of his life, Teilhard argued that the evolution of the universe can be accounted for by the same fundamental principles. Indeed, it is at these origins of Teilhard's evolutionary cosmology that the foundations of his principle of convergence are laid. Teilhard questions the view that red shift—the phenomenon of the reddening of the galaxies—is due to their movement away from an initial explosion in which space was created and to the corresponding decreased frequency of the light waves, rather than to other process such as photon decay (Teilhard [1951] 1978a, 283). He advocates instead the view of the big bang associated with James Jeans, that the world consisted, in its earliest period, of a diffused atmosphere of extremely low density, which he terms a "primordial chaos".[4] Because this atmosphere was subject to gravitational instability, and as the result of a slight disturbance to its composition—a contingency which was bound to arise—it began to disintegrate into parts that formed immense clumps from which galaxies were born. The same disruptive process then operated within the individual galaxies,

generating smaller clumps out of which stars were born, and so on, creating progressively more complex entities.

Teilhard develops this theme of creation as an intensification of the density of being theologically by drawing on an interpretation of the Garden of Eden narrative in the homily of Gregory of Nazianzus "On the Theophany, or Birthday of Christ," which he says "explains the expulsion from Eden as the fall into a 'denser' form of life" (Teilhard [1947] 1974, 191n7). Of Adam's rejection from paradise, Gregory states:

> For his sin he was banished, at once from the Tree of Life, and from Paradise, and from God; and put on the coats of skins … that is, perhaps, the thicker [sic] flesh, both mortal and contradictory. (Gregory 1961, sec. 12, 348; see Genesis 3:21)

The standard translation of this passage presents the coats of skins as signifying the "coarser" flesh, but this imputes to them a penitential status and thereby imposes on the passage a moral sense that is not Gregory's principal concern. The image of "thicker skins" (Winslow 1979, 68–69) is closer to what Teilhard correctly believes the essential meaning of the expulsion from Eden to be: not a fall from a sanctified spiritual state into sinful embodiment, but a change in the nature of embodiment and an increase in the *weight* of the flesh.[5] This echoes suggestively Jeans' conclusions about the origins of the universe in matter of extremely low density forming progressively larger masses. It is a more useful image for Teilhard of the origins of life because it avoids the suggestion that the act of creation is localized at a single infinitely small point of space and a specific originating point of time. That is, as I will show, closer to the imagery he employs to portray the *end* of evolution.

Any theological account of creation is inevitably bound up with the question of the origins of sin. Teilhard understands sin as primarily a state of necessary multiplicity, plurality and ontological deficiency: sin does not, in other words, originate in a contingent event within creation that might not have occurred, but is a *condition for* creation. This

conception of an original fall into being provides the launching point for his theory of evolution, which describes a creative and redemptive process in which the world is drawn towards an ever closer unity and self-consciousness which it originally lacked. Sin is the "essential reaction of the finite to the creative act" and the "*reverse side* of all creation." In his unpublished journal, Teilhard writes of sin:

> It isn't an act committed *within* the universe; —It is an event which accompanied the formation of the universe, so as to mix itself completely with creation, before all time and all space. Original sin is implicated in the initial creation of the world. —As far as we can see, behind and around us, everything is *under sin*—but also *under Christ*. —It corresponds to a fall into being, to a universal materialization which Christ's influence causes to emerge into spirit.[6]

Sin therefore makes possible the subsequent emergence of complex beings. Only following the creative act of which the "reverse side" is sin may any subsequent events involving complex created beings occur.

Teilhard defines complexity in terms of both essence and relation. Beings need to be understood in themselves, but also in terms of their connexions with other beings. Complexity depends, he states

> not only on the number and diversity of the elements included in each case, but at least as much on the number and correlative variety of the links formed between these elements. It is not, therefore, a matter of *simple* multiplicity but of organized multiplicity; not simple complication but *centrated* complication. (Teilhard [1944] 1964, 105)

Teilhard presents this complexity as a consoling antidote to a view of the cosmos as a vast, inhospitable realm in which the whole of planetary life, including human life, is no more than a brief interlude between primal soup and eternal death. A proper appraisal of the importance

of complexity requires, he affirms, a "complete reversal of values and perspective" (Teilhard [1944] 1964, 108). The Pascalian fear of the great, infinite and primitive spaces of the cosmos is answered, he suggests, by the fact of the existence of localized entities and communities of entities. Consider the largest objects in the universe, composed of simple combinations of nuclei and electrons such as hydrogen, in which material evolution is unable to progress much beyond a simple atomic series. In the face of such a void as this, any complex life, let alone human life, might appear meaningless. On planets, clearly far smaller entities, there can however occur the "mysterious ascent of the world into the sphere of advanced complexity." The highest current manifestation of complexity is human life, which is characterized by consciousness, reflective capacity and personality. It is in smaller formations that the real significance of complex life, in both essence and relation, is to be uncovered.

Convergence, Humanity and Christ

The detailed paleonotological research underlying Teilhard's theory of evolutionary convergence has, to a considerable extent, been superseded by more recent research in the fields of paleobiology and genetics. Many of the theories he develops nevertheless remain strikingly apposite to current debates. He states, for instance, that one "sign for the naturalist of the origin of a living branch is a certain convergence of that branch's axis with the axis of neighbouring branches" (Teilhard [1940] 2003a, 125–26). In the course of his many years of research and excavation, especially in China, Teilhard realized that the range of actual evolutionary mutations was small in comparison with the number of possible ones and recognized the rapid speed with which evolutionary change occurred. Both these factors suggested to him that something more than purely random processes was at work in

generating evolutionary change. Teilhard's perspective is supported by the array of evidence recently presented by Simon Conway Morris in support of the ubiquity of evolutionary convergence in a universe of exuberant biological diversity (Conway Morris 2005a, 2005b). Conway Morris portrays evolution as unfolding according to a necessarily preordained path, although draws, as will be seen, very different theological conclusions from this fact.

The implications of convergence and complexity for natural theology are, indeed, underdeveloped in current debates both within the philosophy of religion and in the field of science and religion. The conclusions which Teilhard draws from his combined scientific research and theological reflection have the potential to reinvigorate these discourses. Teilhard insists that God should not be conceived as a static pole of consistence governing a stable world, but as a prime mover *ahead*. He proposes: "The Higher Life, the Union, the long dreamed-of consummation that has hitherto been sought *Above*, in the direction of some kind of transcendence: should we not rather look for it *Ahead*, in the prolongation of the inherent forces of evolution?"[7] God the pole of consistence becomes, in Teilhard's theological cosmology, God the "Prime Mover, Gatherer and Consolidator, ahead of us, of evolution" (Teilhard 1966b, 121). In light perhaps of statements such as these, Arthur Peacocke has noted the tendency of "Teilhardian theologians" to "extrapolate into the future from the past" (Peacocke 1979, 338–339, 349), but Teilhard's own concept of the God *Ahead* is derived principally from the God *Above* rather than from the Bergsonian notion of an original primordial unity possessing quasi-theistic attributes. A profound continuity certainly exists between the God *Ahead* and previous evolutionary history. Nevertheless, looking at the matter from the temporal human perspective to which Peacocke refers, the God *Ahead* provides the evolutionary dynamic with a source which subsists in the future and draws the world towards its final consummation.

This concept of a God of the *Ahead* has implications for an understanding of the person of Jesus Christ. Teilhard is determined to develop a clear and dynamic alternative to modernist christology, which had its basis in the historical criticism of scripture. Pope Pius X's 1907 encyclical *Pascendi dominici gregis* charges the modernists with calling into question the divine nature of Christ, by "not sparing even the person of the Divine Redeemer, whom, with sacrilegious daring, they reduce to a simple, mere man" (sec. 2; *Papal Encyclicals* III:71). Teilhard's position supports this critique. The reading of scripture is not, he believes, a purely exegetical activity, but a synthetic one.[8] Personal faith, church tradition, and the various fields of scientific research all bring crucial insights to bear on our reading of the sacred texts. The modernists failed fully to accept this basic principle, but so did the church authorities attacking them. Teilhard protests:

> One cannot remain true to Catholicism and be content with a mediocre explanation, a limited outlook which represents Christ as an accident of history, isolating Him in the Cosmos as if He were an episode without proper time and place. (Teilhard [1919] 1976, 23)

The coming of Christ into the human world is not completed in the birth of Jesus in Palestine. Rather, this particular historical event inaugurates the entry of the whole created order into Christ. Incarnation, far from being confined to a discrete event at a particular point in historical time, is an ongoing movement that transforms the world and creates the historical reality it enters. Although exemplified by the entry of Jesus Christ into the human world to assume human form, its final purpose is the redemption of the whole cosmos. Teilhard affirms:

> The Incarnation is a making new, a restoration, of all the universe's forces and powers; Christ is the Instrument, the Centre, the End, of the whole of animate and

> material creation; through him, everything is created, sanctified, and vivified. (Teilhard [1916] 1968, 58)

The divine nature of Jesus Christ, his eternal birth in the Godhead, and his work of redemption and salvation transform material life through the whole range of its levels of being. In order that the world be redeemed, it is necessary for Christ to "enter into contact with every one of the zones of the created, from the lowest and most earthly to the zone that is closest to heaven" (Teilhard [1923] 1974, 71).

## Consummation and Omega

A wholly naturalistic explanation of human evolution, whether Darwinian or Lamarckian, would, as has just been suggested, fail to take account of the full significance of the incarnation for material life. In an early encyclopedia essay, however, Teilhard excludes a purely natural evolutionism on different grounds: that it would be incompatible with essential axioms of church teaching. He states:

> We conclude by rejecting necessarily an evolutionism which, linking humanity in the fullness of its being to inferior life forms or to matter, regards it only as the product of a transformation—whether from like to like, by the reshaping of primitive compounds—or from lesser to greater, by increases (which were due to a divine source), that will not culminate in an unanticipated and profound reordering, a rending of the vital current, placing humanity in a region of transcendence and stability. (Teilhard [1912] 1924–28, sec. 505, my trans.)

Intrinsic to Teilhard's belief that the universe will undergo this final consummation is the Pauline theology of the cosmic role of Christ, developed by Paul in order to take full account of the implications for humanity and the cosmos of the fact that the whole fullness of God

dwells bodily in Christ, who is "He in whom everything is reunited, and in whom all things are consummated—through whom the whole created edifice receives its consistency—Christ dead and risen, who fills all things, in whom all things consist." (Teilhard 2004, 84)[9] Teilhard thus insists on the necessity of both Christ's natures—the human as well as the spiritual—describing Christ, in words which gloss perhaps four scriptural passages, as

> the Alpha and the Omega, the principle and the end, the foundation stone and the keystone, the Plenitude and the Plenifier. He is the one who consummates all things and gives them their consistence. It is towards him and through him, the inner life and light of the world, that the universal convergence of all created spirit is effected in sweat and tears. He is the single centre, precious and consistent, who glitters at the summit that is to crown the world, at the opposite pole from those dim and eternally shrinking regions into which our science ventures when it descends the road of matter and the past. (Teilhard [1921] 1968, 34–35)[10]

This salvation which Christ-Omega accomplishes is at once spiritual, being a transformation of material life according to a non-material principle, and cosmic, affecting the entire created order. The end which it presents to history and which gives history its linear direction contradicts the cyclical models which prevailed in pre-Christian philosophy (Benz 1966, 67–68). The view of historical development characteristic of modernity is, in other words, established by Christian theology and made a reality in the unceasing redemptive action of Christ on the world.

Teilhard finds particular inspiration for this christological reading of the modern linear concept of historical progression in some of the Greek Fathers, who transpose the "evidence of Revelation into a universe of the non-static type." He appropriates, more specifically, the cosmology of Irenaeus of Lyons, which he describes as an "astonishing anticipation of our modern views of progress" (Teilhard [1946] 1968b, 189; [1939] 1969,

167n). It must be emphasized, however, that the type of progress which Irenaeus conceives is only progress because it is informed by a spiritual principle which constitutes and affirms human life, and in so doing transforms that life. Omega is, in theological terms, the point at which "Christic faith comes in to take over from and to consummate faith in humanity" (Teilhard [1948] 1975, 203). It is the point at which the unsatisfied hopes and uncompleted projects of humanity are gathered up and consummated in Christ, and not an end-point of history attained by human effort alone.

## The Future of Evolution

Teilhard portrays humankind "now standing upon its own feet" and "entering into a new era of autonomous control and self-orientation" (Teilhard [1948] 1975, 181). What does this mean in practice? The best example of the human appropriation of natural forces that occurred during Teilhard's lifetime is nuclear fission. Reflecting on this technological advance, he avers that humankind "has succeeded in seizing and manipulating the sources commanding the very origins of matter" (Teilhard [1946] 1964, 142; [1953] 1978a, 347–57). This is clearly an ambivalent achievement, however, containing the potential to generate energy to preserve human life as well as to construct weapons capable of obliterating that life. Teilhard expresses similar ambivalence over genetic manipulation, observing how humankind feels itself to be "on the verge of acquiring the power of physico-chemical control of the operations of heredity and morphogenesis in the depths of its own being" (Teilhard [1948, 1947] 1964, 234, 197). He states:

> As a direct result of its socialization, humankind is beginning, with rational design, to take over the biological motive forces which determine its growth—in other words, it

is becoming capable of modifying, or even of creating, its own self. (Teilhard [1948] 1975, 181)

Biological realities no longer provide a fixed set of conditions within which humanity makes moral decisions. They are more likely to become products of those decisions which themselves construct the human subject and thus condition his or her subsequent moral choices. The classic order of a shared conception of static human nature generating an ethic which epistemologically grounds a moral framework and motivates adherence to it no longer applies: "Material determinisms," Teilhard states, "cease to provide the skeleton of the world; they are merely a secondary effect in the cosmos." (Teilhard [1931, 1937] 1969, 29, 102)

Teilhard believes passionately that theological and ethical principles need to be developed to enable modern humanity to make sense of its tremendous powers over matter and to exercise those powers responsibly and constructively. Moral questions surrounding the use of technology to intervene in biological processes have evidently become more sharply focused since his lifetime, simply because they are a product of the ever increasing number of technologies actually available or under development. Teilhard's general analysis of these questions nevertheless remains pertinent, and is in places prophetic. Humankind's production of new technology is, he observes, "more and more patently exceeding its powers of absorption and assimilation" (Teilhard [1931] 1969, 36–37). Jürgen Habermas, in the course of making a similar point, describes this progressive estrangement of material production from consciousness as "dissonance of intention," and argues that what is needed to counteract it is a renewed understanding of the fusion of nature and soul (Habermas 2003, 60–64). Teilhard expresses a corresponding belief in his frequent statements that the ordering of nature by soul is needed to provide the cosmos with its telos (Teilhard [1917] 1968a, 168; [1921] 1968b, 29–30). The organization of technical production in accordance with moral and religious principles is, in other words, a real possibility, and moreover essential for the

future flourishing of the human species. Modern technology, far from being a Promethean theft from the deity of a power which is rightly its own (Teilhard [1946] 1964, 147), in fact promotes a necessary sharing by humankind in God's creative power. To foster human co-operation in this divine action is the new task for theology and theological ethics.

Teilhard reflects much later on the likely course of the evolution of concrete human life in the more distant future. There is no reason, he argues, to suppose that life will not evolve more complex forms than its present ones (Teilhard [1944] 1964, 113). Nevertheless, humankind also contemplates its finitude and fragility, the prospect of decline and the possibility of disaster. This more pessimistic and obscure strand in Teilhard's thought about the future is based on an appraisal of the human condition rather than on any specific events: it must be remembered that he is writing before the mass production and stockpiling of nuclear weaponry, and prior to humankind's awareness of the rapid pace of global environmental change. He is brought to contemplate the death of the human species simply because it is dependent on the sun, which is a "heavenly body whose days are ultimately numbered" (Teilhard [1944] 1964, 121). He responds with scepticism to the possibility that a future ability to colonize other planets will make human existence everlasting, regarding the technological obstacles of travel to suitable destinations as insurmountable, not to mention the difficulties of generating the basic elements required for survival once in a new location. In any case, he continues, if interstellar travel by conscious material beings were possible, then the Earth would probably already have been invaded and colonized by other such beings. Teilhard speculates that the future for the universe will be a death of the materially embodied dimension of human life in which humankind's spiritual component will become detached from the planet Earth and unified with the Omega point on which not only Earthly evolution converges, but the evolution of the entire universe as well (Teilhard [1944] 1964, 122–23).

The principal shortcomings of Teilhard's evolutionary cosmology are to be found in his theological analysis of its universal dimension. He regards the existence of complex, intelligent life on some of the other planets in the immensity of the universe as a virtual certainty—after all, the diameter of the Earth's orbit compared with that of the universe is in the same order of proportion as that of a pinhead on the surface of the American continent (Teilhard [1953] 1974, 231; [1944] 1964, 101). This raises the question of the status of Christ as universal savior: was the coming of Christ on Earth sufficient to extend the possibility of salvation to the entire universe? Teilhard regards his single earthly incarnation as indeed sufficient for the whole universe, stating: "For the universe is so perfectly one that the Son of God has only to enter into it once in order to occupy and permeate it in its entirety with his filiating grace... He had to be born but once of the Virgin Mary to make his own and divinize the whole of creation." (Teilhard [1953] 1974, 235, n11) It would, perhaps, be more convincing to argue that whilst the eternally begotten Son, existing beyond time and space, would be a feature common to Christian faith on any planet, the historical person of Christ would be incarnated separately on different planets. This would preserve the unity-in-diversity for which Teilhard strives, whilst ensuring that the person of the incarnate Christ was similar to that of all possible beings with faith in him and thus able to share their life in meaningful, tangible ways. An entirely separate problem surrounding the "single incarnation" view is how the revelation of Christ on Earth could be communicated from Earth to other parts of the universe by natural means. The scepticism with which Teilhard regards the possibility of interstellar travel has already been noted.

The new vistas and possibilities opened by technologies such as genetic manipulation are in any case far more significant for the future of humanity than the possibility of its colonization of other planets. Advances in genetic understanding enable humankind to reinvent itself as the co-creator of its future essence. The inextricable link between evolution

and complexity, confirmed by faith in a personal deity, calls the Christian scientist to focus attention on current human life on this planet. This is where the depth, complexity and future potential of life reside, ordered by Christ's providential action in human creativity.

Teilhard's determination to take the theological implications of complexity as seriously as those of convergence leads him to a more positive appraisal of the existential situation which evolution produces than the one recently suggested by Simon Conway Morris, who infers that evolutionary convergence generates "inevitable humans in a lonely universe" (Conway Morris, 2005a). Teilhard wishes, in contrast, to consider the theological implications of complexity alongside those of convergence. Complexity makes possible new centers of consciousness and community which manifest their own creative capacity. The convergent universe is no longer lonely, Teilhard argues, having created, in its comparatively recent past, complex beings and communities capable of communication, conversation, friendship, love and praise.

Teilhard's evolutionary natural theology provides a constructive Christian response to Michael Ruse's call for a "kind of reinvigorated Lamarckism" to contribute to a restoration of the credibility of natural theology in the face of crude intelligent design arguments (Ruse 2003, 304). Teilhard unsettles simple modern oppositions, grounding his cosmology in faith, theology and religious experience as well as evidence from scientific research, both his own and others'. In *The Human Phenomenon*, he states of the Omega Point: "I probably would never have dared to consider or form the rational hypothesis of it, if I had not already found in my consciousness as a believer not only the speculative model for it, but its living reality." (Teilhard 2003a, 211) This living reality was his faith in Christ, who reveals himself in evolution as the principle of the creation, conservation and consummation of the universe. Teilhard's dynamic vision is far removed from the static cosmology of William Paley, which

remains the ubiquitous textbook example of natural theology. It provides suggestive openings for a more current and more arresting version.

References

Teilhard de Chardin, Pierre. [1912] 1924–28. « Homme : IV : l'homme devant les enseignements de l'Église et devant la philosophie spiritualiste. » In *Dictionnaire apologétique de la foi catholique*, II:501–15. 4 vols., 4th edn. Paris: Beauchesne.

———. [1940] 1959. *The Phenomenon of Man*. London: Collins.

———. 1964. *The Future of Man*. London: Collins.

———. 1966a. *The Vision of the Past*. London: Collins.

———. 1966b. *Man's Place in Nature*. London: Collins.

———. 1968a. *Writings in Time of War*. London: Collins.

———. 1968b. *Science and Christ*. London: Collins.

———. 1969. *Human Energy*. London: Collins.

———. 1974. *Christianity and Evolution*. San Diego: Harvest.

———. 1975. *Toward the Future*. San Diego: Harvest.

———. 1976. *Pierre Teilhard de Chardin – Maurice Blondel: Correspondence*. New York: Herder & Herder.

———. 1978a. *Activation of Energy*. San Diego: Harvest.

———. 1978b. *The Heart of Matter*. San Diego: Harvest.

———. [1940] 2003a. *The Human Phenomenon*. Brighton: Sussex Academic Press.

———. 2003b. *Notes de retraites, 1919–1954*. Paris: Seuil.

———. 2004. *The Divine Milieu*. Brighton: Sussex Academic Press.

———. Journal, unpublished.

Benz, Ernst. 1966. *Evolution and Christian Hope*. London: Doubleday.

Bonnet, Charles. 1783. *La Palingénésie philosophique, ou Idées sur l'état passé et sur l'état futur des êtres vivants : ouvrage destiné à servir de supplément aux derniers écrits de l'auteur et qui contient principalement le précis de ses recherches sur le christianisme*. 2 vols. Neuchâtel: Fauche.

Conway Morris, Simon. 2005a. *Life's Solution: Inevitable Humans in a Lonely Universe*. Cambridge University Press.

———. 2005b. "Darwin's Compass: How Evolution Discovers the Song of Creation." 2005 Boyle Lecture. http://www.stmarylebow.co.uk/news/boyle2005.htm.

Darwin, Charles. [1859] 1964. *On the Origin of Species by Means of Natural Selection*, *or the Preservation of Favoured Races in the Struggle for Life*. Cambridge, Mass.: Harvard University Press.

———. 1871. "Pangenesis." *Nature* 3:502–503.

———. 1882. *The Descent of Man and Selection in Relation to Sex*. 2nd edn. London: John Murray.

———. 1899. *The Variation of Animals and Plants under Domestication*. 2nd edn. 2 vols. London: John Murray.

Farber, Paul Lawrence. 1999. "French Evolutionary Ethics during the Third Republic: Jean de Lanessan." In *Biology and the Foundation of Ethics*, eds. Jane Maienschein and Michael Ruse, 84–97. Cambridge: Cambridge University Press.

Gregory of Nazianzus. 1961. "Homily 38: On the Theophany, or Birthday of Christ." In *Nicene and Post-Nicene Fathers of the Christian Church*, series II/7:345–52. 28 vols. Grand Rapids, Mich.: Eerdmans.

Grumett, David. 2005. *Teilhard de Chardin: Theology, Humanity and Cosmos*. Leuven: Peeters.

Habermas, Jürgen. 2003. *The Future of Human Nature*. Oxford: Polity.

Haught, John. 2005. "Darwin, Design and the Promise of Nature." Boyle Lecture 2004. *Science and Christian Belief* 17:5–20.

Heller, Michael. 1995. "Teilhard's Vision of the World and Modern Cosmology." *Zygon* 30:11–23.

———. 2003. *Creative Tension: Essays on Science and Religion*. Philadelphia, Pa.: Templeton Foundation.

Hodge, Michael J.S. 1985. "Darwin as a Lifelong Generation Theorist." In *The Darwinian Heritage*, ed. David Kohn, 207–244. Princeton, NJ: Princeton University Press.

Jeans, James. 1902. "The Stability of a Spherical Nebula." *Philosophical Transactions of the Royal Society of London. Series A* 199:1–53.

———. 1919. *Problems of Cosmogony and Stellar Dynamics*. Cambridge University Press.

———. 1929. *Astronomy and Cosmogony*. 2nd edn. Cambridge University Press.

Lamarck, Jean Baptiste. [1809] 1984. *Zoological Philosophy: An Exposition with Regard to the Natural History of Animals*. Chicago, Ill.: University of Chicago Press.

Lubac, Henri de. [1965] 1998. *The Mystery of the Supernatural*. New York: Crossroad.

McGowen, Tom. 1990. *The Great Monkey Trial: Science Versus Fundamentalism in America*. New York: Franklin Watts.

Moltmann, Jürgen. 1990. *The Way of Jesus Christ: Christology in Messianic Dimensions*. London: SCM.

———. 2003. *Science and Wisdom*, London: SCM.

*The Papal Encyclicals*. 1990. 5 vols. Pierian: Ann Arbor.

Peacocke, Arthur. 1979. *Creation and the World of Science*. Oxford: Clarendon.

Roberts, Noel Keith. 2000. *From Piltdown Man to Point Omega: The Evolutionary Theory of Teilhard de Chardin*. New York: Peter Lang.

Ruse, Michael. 2003. *Darwin and Design: Does Evolution have a Purpose?* Cambridge, Mass.: Harvard University Press.

Sloan, Phillip R. 1999. "From Natural Law to Evolutionary Ethics in Enlightenment French Natural History." In Maienschein and Ruse, 52–83.

Winslow, Donald F. 1979. *The Dynamics of Salvation: A Study in Gregory of Nazianzus*. Cambridge, Mass.: Philadelphia Patristic Foundation.

Word count

6,670 words (excluding references), 7,320 words (including references)

---

[1] The defendant John Scopes, a science teacher, was found guilty of infringing the prohibition and fined $100. See McGowen 1990.

[2] The classic critique of this "pure nature" tradition is De Lubac [1965] 1998.

[3] The terms in each bracket are those used in the new and original translations respectively (Teilhard 2003a, 1959).

[4] Teilhard [1946] 1964, 102; Jeans 1902, 1–53; 1919, 188–202; 1929, 345–50. He regards this cosmology as not incompatible with Georges Lemaître's view of the universe expanding in(to) space from a primitive atom (Teilhard [1948] 1978b, 148; Heller 2003; 1995, 12).

[5] Retreat note of 25 July 1922 in Teilhard 2003b, 101; see also extensive notes in unpublished Journal, 9–18 May 1921, cahier VIII.

[6] Entry in unpublished Journal, 29 May 1920, cahier VIII, my trans.

[7] Teilhard [1949] 1964, 263. The context makes clear that *Above* and *Ahead* are not being presented as mutually exclusive terms. Similar dialectics are identifiable in the discussion of the interrelations of creation, history and eschatology in Moltmann 2003.

[8] See notes in unpublished Journal, 1 January 1945, cahier XIII.

[9] For the origins of this christology in Pauline scholarship of the early twentieth century, see Grumett 2005, 114–116.

[10] Cf. Revelation 22:13, Colossians 1:17, John 8:12, Romans 8:22.