

POLANYI ON TELEOLOGY: A RESPONSE TO JOHN
APCZYNSKI AND RICHARD GELWICK

by *Walter B. Gulick*

Abstract. Michael Polanyi criticized the neo-Darwinian synthesis on two grounds: that accidental hereditary changes bringing adaptive advantages cannot account for the rise of discontinuous new species, and that a teleological ordering principle is needed to explain evolutionary advance. I commend the previous articles by John Apczynski and Richard Gelwick and also argue, more strongly than they, that Polanyi's critique of evolutionary theory is flawed. It relies on an inappropriate notion of progress and untenable analogies from the human process of scientific discovery and the fact that in physical systems minimal potential energy is most stable. Yet within a life of commitment to transcendent values humans can directly experience purpose and meaning, and in developing this notion Polanyi makes his greatest contribution to teleology.

Keywords: evolution; field theory; organizing and ordering principles; Michael Polanyi; religious satisfactions; teleology.

John Apczynski and Richard Gelwick have provided excellent expositions of Michael Polanyi's understanding of the teleological dimension of existence. The two essays are complementary and together, I believe, capture well what Polanyi was up to. Apczynski attends closely to key steps of the evolutionary argument Polanyi presents in *Personal Knowledge* ([1958] 1964), whereas Gelwick considers Polanyi's thought as a whole and teases out its broader implications with respect to purpose in the universe.

I find no substantive problems with the exposition of either writer. Each is an admirable work of interpretation, analysis, and assessment. The two essays move me to raise different sorts of questions. Apczynski inspires me

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to raise questions about Polanyi's notion of heuristic, morphogenetic, and phylogenetic fields in a dynamic cosmos and other notions discussed in the final pages of *Personal Knowledge*. Polanyi's ideas here are rich and suggestive but also at times seem more enigmatic, perplexing, and indeed problematic to me than to Apczynski. Gelwick inspires me to explore, timidly, the platform for theological inquiry that Polanyi provides. I suggest that what Polanyi says about God can be seen as a discussion of different experiences of the purposefulness of the cosmos set in religious rather than teleological language.

POLANYI'S CRITIQUE OF EVOLUTION- A MISUNDERSTANDING?

I begin by highlighting the two major charges Polanyi makes against the neo-Darwinian synthesis. The import of his charges is that evolutionary theory is insufficiently teleological. Because contemporary biologists would likely not consider Polanyi's charges valid, I offer possible responses they might make to Polanyi.

First, Polanyi contends that the emergence of new levels of life cannot be conceived as arising from an evolutionary process that is "the sum total of successive accidental hereditary changes which have offered reproductive advantages to their bearers" ([1958] 1964, 382). Polanyi seems to believe that the received view of evolution does not account for how it is that new species could arise manifesting operational principles that are discontinuous with those of their predecessor species. "I deny that any entirely accidental advantages can ever add up to the evolution of a new set of operational principles, as it is not in their nature to do so" ([1958] 1964, 385). Implicit in his charge is his belief that the neo-Darwinian synthesis treats biological change much as chemists and physicists tend to deal with change, namely, as subject to a reductive analysis that overlooks any discontinuities or indeterminacies between the entities being analyzed.

Here is what the contemporary biologist might say in reply. Polanyi is wrong to think that biologists are almost inevitably reductive in their thought. Biologists recognize that natural selection issues in the emergence of new species as discontinuities in the process of evolution. This is because evolution must not be thought of simply in terms of one type of individuality that mysteriously morphs into another type of individuality. Evolution must be understood as involving many centers of individuality, each within a species and having slightly different heritable characteristics, competing with each other and members of other species in a dynamic environment. Over the long term, centers with heritable characteristics particularly well suited to an environment will tend to better commandeer food sources, avoid enemies, and reproduce, passing on their characteristics to their descendents. The particular traits of each newborn may be accidental in the sense that, even knowing the parents' genetic makeup,

the particular traits could not be precisely predicted, but they would fall within the species' range of traits specified by genetic theory. There is nothing accidental about the range of traits manifest in a particular species and especially nothing accidental about what traits are best adapted to a particular environmental niche. Just as environmental conditions change through drought, ice age, and so forth, the corresponding traits best adapted to those conditions change, and this gives rise to genetic drift in those species that adapt to the new circumstances. Over a sufficiently long period of time, the genetic drift of an original species in two differently evolved environments will lead to separate species, members of one no longer able to reproduce with members of the other.

This response sets the stage for Polanyi's second major criticism of neo-Darwinian thought. Apczynski and Gelwick each note that Polanyi postulates the existence of an ordering principle as necessary to account for the rise of new species culminating in humans. Polanyi states that "the *ordering principle* which *originated* life is the *potentiality* of a stable open system" ([1958] 1964, 383-84). This ordering principle is a feature of reality in addition to the organizing principles that govern both an animal's mechanical processes and its integration of all its processes within an individual center engaged in deliberate actions (pp. 342-45, but also see p. 401, where Polanyi seems to conflate ordering and operational [organizing] principles).

In elaborating how this ordering principle might generate new species, Polanyi seems to hold that two complementary factors need to be postulated. They are needed to explain how responsible personhood might have emerged in the cosmos.

First, within the biotic world there is a gradually intensified drive to achieve greater participation in reality. This drive manifests three degrees of originality: (1) the centered resourcefulness of trick and latent learning (see Polanyi [1958] 1964, 71-77), (2) ontogenetic development resulting in the emergence through maturation of new levels of skills and insights in an individual (pp. 338 ff.), and (3) phylogenetic emergence built out of heuristic achievements whereby, presumably, new species might evolve (p. 399). These thrusts of evolution are embodied in the passionate, striving activities of individual centers of life seeking satisfaction.

But, second, this striving would get nowhere unless there were characteristics of the environment that supported, indeed almost invited, consummatory satisfactions. A stable open environment offers centers of life the potential for consummation insofar as it functions as a heuristic field. From his understanding of discovery as the following of a gradient of felt increasing nearness to the environmental real, a feeling producing satisfaction once stable understanding is achieved, Polanyi generalizes the notion of the ultimate ordering principle that originates life and its emergence into higher forms. "The assumption of a heuristic field explains now how

it is possible that we acquire knowledge and believe that we can hold it, though we can do this only on evidence which cannot justify these acts by any acceptable strict rules. It suggests that we may do so because an innate affinity for making contact with reality moves our thoughts- under the guidance of useful clues and plausible rules- to increase ever further our hold on reality" ([1958] 1964, 403). Presumably all life seeks and can find analogous forms of satisfaction in environmental stability.

QUESTIONS CONCERNING POLANYI'S ACCOUNT

Now it is time to raise broadly philosophical questions about Polanyi's perspective on evolution, which, as Apczynski notes, "is clearly finalistic" (2005, 85).

1. Polanyi's argument rests upon an analogy between the epistemological process of discovery and the biological processes of ontogeny and phylogeny. But are there not significant differences in kind between the processes whereby (a) an individual makes a discovery, (b) a growing individual matures, and (c) a species evolves? It seems reasonable for Polanyi to stress the role of an individual center in a living being, but how does this give him any basis for talking about "centers of phylogenetic fields" ([1958] 1964, 405)? Individuals reaching goals have the telic satisfactions that Polanyi speaks of as achievements (see chapter 11 of *Personal Knowledge*, "The Logic of Achievement"), but I see no plausible grounds for Polanyi to extend the notion of achievement to whole species, which obviously have no feeling centers comparable to the centers of individuals.

2. Has Polanyi smuggled an essentially Enlightenment notion of progress into his understanding of evolution? The title of the last chapter of *Personal Knowledge* is "The Rise of Man," and it recounts how the emergence of the responsible human being is the climax of a long process beginning in the primeval slime. Polanyi is acutely aware of human frailty, but it seems that he sees the advent of humanity as the highest and best stage of evolutionary progress. Is this view satisfactory from a biological standpoint? from a humanistic standpoint?

3. What is one to make of Polanyi's claim that a preexisting ordering principle, patterned on a heuristic field leading to stability, originated life and makes possible emergence?

A biologist would deny that any such preexisting principle is necessary to explain evolution and would use Occam's Razor to reject Polanyi's claim. The biologist might go on to point out that matter seems to have self-organizing qualities that can be observed but require no metaphysical explanation.

Sometimes Polanyi acknowledges the existence of self-organization that seems to require no additional principles. "No richly endowed new reality can be seen emerging in the inanimate domain. This happens for the first time in the emergence of a living being from inanimate constituents. I

have described this process as a chance fluctuation which releases the action of certain self-sustaining operational principles. . . . No new creative agent, therefore, need be said to enter an emergent system at consecutive new stages of being" (Polanyi [1958] 1964, 394-95). Polanyi, however, seems to regard the foregoing analysis as adequate to explain the continuity in evolution but not as adequate to explain "essential progress" (p. 395). Is this another example of how the bogeyman of "progress" (question 2) haunts his understanding?

4. Does Polanyi inconsistently import a physical notion of stability into his analysis of evolution? He states that "the pathways of biotic achievement have dynamic properties analogous to those of pathways along which the potential energy of a system decreases" (p. 402). The notion of potential energy comes from physics. Why does Polanyi use a concept from the lower level of physics to explain biological evolution, which requires a higher-level law presumably of a different quality than the laws of physics and chemistry?

5. Given that Polanyi acknowledges the cosmos to be a dynamic, changing entity (see Gelwick 2005, 70-71), what effect would that protean quality have on a heuristic or phylogenetic field? Would it not make more sense to emphasize the importance of adaptation to such change rather than "the potentiality of a stable open system"?

6. Apczynski affirms Polanyi's goal of "providing a more comprehensive level of meaning for understanding scientific claims" (2005, 86), a meaning culminating in a "vision of a purposive universe" (2005, 81). But does Polanyi finally achieve this vision in circular fashion by assuming what he wants to demonstrate, namely, that a purposive ordering principle is ultimate in the cosmos?

Gelwick, more insistently than Apczynski, emphasizes the open quality of Polanyi's thought. Gelwick stresses the excitement of the journey to knowledge in the company of a society of explorers. Purpose in Gelwick's interpretation arises out of the satisfactions inherent in envisioning the truth and stretching through risky transnatural integrations to encompass the many levels of reality. The metaphysical ordering principle seems unnecessary to this approach.

Ursula Goodenough, as a biologist who is also a religious naturalist (1998), would want to reject the metaphysical dimension of Polanyi's teleology while embracing the telic dimension Gelwick mentions (2005, 65-67). This raises an important question: Can meaningful personal existence be affirmed even as one rejects teleology in the universe?

7. What, then, seems a fair assessment of Polanyi's views on teleology and evolution in a cosmic context? It seems to me that Polanyi either misunderstands or misrepresents the neo-Darwinian synthesis. Evolutionary theory has no need of teleology to explain the rise of life and the development of new species within life. Chaos theory and complexity theory,

which emerged into general consciousness well after Polanyi's death, have made much clearer how evolution may be understood as a process of self-organization. Indeed, Polanyi's ordering principle of stability may be seen as a crucial element in self-organization. But there is no good reason to postulate an immanent drive within the cosmos to realize the potentiality of a stable open system. Marjorie Grene, the eminent philosopher of biology who essentially tutored Polanyi in philosophy, rejected Polanyi's version of evolution quite vehemently. Upon rereading it, she finds "Polanyi's argument (of Part IV of *Personal Knowledge*) even more shocking than I had originally thought it" (Grene 2002, 61).

I now argue, however, that the rejection of cosmic teleology on scientific grounds need not entail the rejection of all aspects of teleology.

FROM TELEOLOGY TO THEOLOGY- A SAVING LEAP?

Gelwick's account of Polanyi's teleology emphasizes the significant role of service to such values as truth, justice, and charity, and the honoring of heroes and ideals in bringing about meaningful existence. Narrowly defined goals or even the notion of a designed universe stifle inquiry and may undermine the freedom of exploration that is the glory of humanity. Gelwick chooses not to emphasize the detailed exposition of teleology in Part Four of *Personal Knowledge*, details I question above, but instead situates Polanyi's teleology in relation to theology as follows: "Ultimately, Polanyi takes the finite process of evolution to the boundary condition of transnatural/religious integrations, then leaves open the next step as an act of faith" (2005, 66).

I find this statement to be a grand invitation to contemplation and reflection. What sort of next step does Polanyi find to be a worthy act of faith? To what extent is teleology internally related to his nascent theology? He offers several overlapping possibilities.

1. In the final paragraph of *Personal Knowledge*, Polanyi states, in terms reminiscent of Hegel, that "the appearance of the human mind has been so far the ultimate stage in the awakening of the world" ([1958] 1964, 405). He suggests that human submission to the firmament of values is part of an endeavor toward ultimate liberation, toward an unthinkable consummation. The term *consummation* is apropos in this context: literally it suggests a joint summing up. Yet it is unthinkable. How might we understand the religious overtones of this complex claim?

All beings groping toward meaning and liberation are said by Polanyi to take a stance that is equivalent to "how a Christian is placed when worshipping God" (p. 405). This is a stance of engagement that earlier Polanyi spoke of in these terms:

The indwelling of the Christian worshipper is therefore a continued attempt at breaking out, at casting off the condition of man, even while humbly acknowledg-

ing its inescapability. . . . It resembles not the dwelling within a great theory of which we enjoy the complete understanding, nor an immersion in the pattern of a musical masterpiece, but the heuristic upsurge which strives to break through the accepted frameworks of thought, guided by the intimations of discoveries still beyond our horizon. (pp. 198-99)

This theological interpretation recognizes the limits of teleological insight yet is dissatisfied with these limits. Indeed, Polanyi suggests that the Christian worshipper does *not* enjoy this sort of indwelling (p. 198) but rather, as a sinner, seeks a visitation of powers to accomplish what cannot be accomplished by unaided human powers. In other words, this version of worship seeks a God of grace beyond teleological brokenness.

The attempted consummation is also spoken of by Polanyi in essentially mystical terms. "Religious conceptions like the myth of creation are, however, different in significant ways from the transnatural achievements of poetry and art. The way these religious conceptions speak of the entire universe and of our destiny as human beings within these boundless perspectives makes them mystical by contrast with the concepts of poetry and art; it also makes them sacred" (Polanyi and Prosch 1975, 126). In the *via negativa* of Pseudo-Dionysius the presence of God is sought through a series of detachments from the world. Similarly, Polanyi's mystical consummation is less a summing up than a subtracting down, a distancing from the ordinary particulars of existence in search of union with the underlying ground of all being (1975, 128). In the mystical approach to worship, teleology is transfigured into noncognitive immersion in the divine.

The consummation Polanyi refers to is spoken of in yet another related way that emphasizes the committed stance of worship and minimizes the adequacy of any descriptive notion of God. He says of God that he "exists in the sense that He is to be worshipped and obeyed, but not otherwise; not as a fact—any more than truth, beauty, or justice exist as facts. All these, like God, are things which can be apprehended only in serving them" ([1958] 1964, 279). Here the worship of God is conceived as a heuristic vision, which aligns religion "with the great intellectual systems, such as mathematics, fiction and the fine arts, which are validated by becoming happy dwelling places of the human mind" (p. 280). The emotionally satisfying aspect of religion is suggested in this conception; in the language of *Meaning* (Polanyi and Prosch 1975, 180), the worship of God carries us away to the felt satisfactions of greater meanings. To be sure, the God whom one serves is understood in terms of some factual evidence and sense of content governed by notions of plausibility, and the notion of happy dwelling place of the mind is not totally separated from emotional states of doubt, sin, and anguish. But I think it fair to suggest that the worship of and serving of God has a teleological flavoring. By worshipping a God who is involved in salvation history and who can be experienced in rituals and through prayers, one participates in a purposeful cosmos.

2. The trajectory of transnatural integration is interpreted in religious terms most forcefully in Polanyi's discussion of God in *Meaning*. "Through our integrative, imaginative efforts we see him as the focal point that fuses into meaning all the incompatibles involved in the practice of religion. But, as in art—only in a more whole and complete way—God also becomes the integration of all the incompatibles in our own lives" (1975, 156). God is here conceived as the ultimate expression of coherent meaning in the universe and in our own lives. Belief in God is consistent with faith that the universe is telic and meaningful both intellectually and emotionally. I believe that in the final analysis Gelwick is correct in insisting that Polanyi opposes the closed or finalistic view of traditional teleology, but, as both Apczynski and Gelwick claim, Polanyi's notions of individual centeredness in the biotic world and responsible personhood in the human world are each thoroughly infused with an immanent, religiously articulated form of teleology. Polanyi believes that being committed to truth, love, and ultimately God is a virtually self-authenticating way of discovering how life is invested with purpose and significance. It is such lived purpose that is Polanyi's great contribution to an understanding of teleology, not his discussion of purpose in evolution.

NOTE

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