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Obsah

Teleology in Pierre Teilhard de Chardin and Michael Polanyi

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Almost at the same time, the Jesuit scientist Pierre Teilhard de Chardin (1881–1955) and the scientist Michael Polanyi (1891–1976) wrote works that addressed the phenomena at the basis of the real world that escape empirical scrutiny. Teilhard, as a paleontologist professionally delving deep in the prehistoric past of human existence, searched for a guiding principle of human reality. Polanyi as a chemist diagnosed that personal satisfaction drives theories in natural sciences. Both came to the conclusion, however diverse, that *aiming as such* drives the development of human understanding. Consequently, humanity is embedded in an objective teleology, which the individual thinker, as well as human community perform and sustain. In order to make the parallel between those two thinkers plausible, I start with Polanyi and how he appreciated Teilhard.[1]

1 Michael Polanyi was born in Budapest in 1891 and died in 1976 in Northampton, England. He had a degree in medicine and in physical chemistry. After WWI he worked with Fritz Haber at the Kaiser Wilhelm Institute in Berlin in chemistry. One of his sons, John Polanyi, was awarded the Nobel Prize in chemistry in 1986, partly as a compensation for the missed prize for the father. After some hesitation he emigrated from Berlin to Manchester in 1933. There he shifted his area of interest to social sciences and philosophy. It was in 1949 in Manchester that he organized a colloquium on the question "Can machines think", which prompted Alan Turing's famous article of 1950, in which he described the now so known Turing test; Blum, P. R., Michael Polanyi: Can the Mind Be Represented by a Machine? Documents of the Discussion in 1949. *Polanyiana* 19, 2010, No. 1–2, p. 35–60, [accessed 4 February 2020]. Available from: http://www.pola-

Michael Polanyi

Michael Polanyi wrote his book *Personal Knowledge* with the intent to prove that science is not reducible to empirical and experimental research, but that in every scientific theory, in every discovery, there is a "tacit" component, a moment that cannot be predicted by the data at hand. His first example is the case of Copernicus: His turning around the planetary system was not prompted by any factual simplification of astronomy, as most people believe still today. Rather, it was a vision and a change that was not confirmed by so-called facts but encouraged by the expectation of future confirmation. Polanyi extended this approach to the societal effects of knowledge, including the scientific community.[2]

For Polanyi, doing science is a felicitous way of thinking humanly; therefore, conviviality over space and time is an anthropological fact. Polanyi's anthropology of knowing is indicated in the heading of the fourth section of his book: "Knowing and Being".

> "The inquiry into the nature and justification of personal knowledge [...] has led to the acceptance of our calling – for which we are not responsible – as a condition for the exercise of responsible judgment with univer-

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nyi.bme.hu/folyoirat/2010-01/2010-1-2-03-Blum.pdf; Turing and Polanyi both claimed that there always remains an unaccountable component in thinking, which cannot be formalized or computerized. The book that mostly interests us toady is his Personal Knowledge of 1958, the result of his Gifford Lectures at the University of Aberdeen in 1951–52.

Pierre Teilhard de Chardin was born in 1881 near Clermont-Ferrant in Auvergne and died in 1955 in New York. He studied physics and paleontology, and he became a Jesuit. During WWI and through his research on geology and paleontology he started re-thinking the creation story of the Bible and the concept of evolution. The Catholic Church refused the imprimatur for his books. But nowadays a petition is under way to declare him Doctor of the Church, especially since Pope Francis quoted him in his Encyclical Letter Laudato si. Cf. https://action.groundswell-mvmt.org/petitions/declare-pierre-teilhard-de-chardin-s-j-a-doctor-of-the-roman-catholic-church

2 Polanyi, M., *Personal Knowledge: Towards a Post-Critical Philosophy*. Chicago, University of Chicago Press 1974, p. 3–6; Polanyi elaborated on Copernicus and the difference between his method and preceding and modern views in fine detail in Science and Reality [1967]. In: Polanyi, M., *Society, Economics, & Philosophy: Selected Papers*. Ed. R. T. Allen. New Brunswick, Transaction Publishers 1997, p. 225–47; This section on Polanyi is using parts of my paper: Blum, P. R., Michael Polanyi: The Anthropology of Intellectual History. *Studies in East European Thought* 62, 2010, No. 1, p. 197–216.

> sal intent. Our calling was seen to be determined by our innate faculties and our early upbringing within our own culture, and these conditions were made to subserve an act of commitment by relying on them for the fulfillment of the standards believed to be universal. [...] We may call this the ontology of commitment."[3]

This is how Polanyi moves from the epistemological to the ontological level. What is interesting for a comparison with Teilhard is (1) the transformation of knowledge into commitment and (2) the interpretation of knowledge with the twin focus of calling and knowing.

We are used to speak of assent and endorsement when ascertaining truth. For Polanyi, that is more than a yes/no – it is an obligation that has its root in the personality of the knowing person. To say yes to any scientific statement is not just lip service; rather, if truly accepted, it is an obligation, a calling from truth and, being ontologically unconditional, this calling comes from beyond. The greater part of the fourth section of this book recapitulates epistemological questions, particularly cognition and motivation in animals, which had reinforced his understanding of commitment and conviviality. He now concludes that commitment and conviviality reach a specific level when cognition is no longer driven by purposes and necessities but mutates into "interest for the fellow being", which implies that "the other person rises above ourselves" and the "acceptance of another's judgment of ourselves".[4]

The traditional hierarchy of intelligent beings as it has been the object of many studies in modernity is presented in terms that are similar to twentieth century philosophy of existence and of personality. The "other" cannot but be perceived as defining the self by being superior.[5] In this case it is biology that yields the conclusion: inquiry into forms of life, as pursued in the chapter "Knowing Life", raises progressively – from the merely receptive vegetation via the purposeful activity of animals and the rationally guided investigation – to the level of the appreciation of the knowledge of the other person and

3 Polanyi, M., *Personal Knowledge*, q. w., p. 279.

4 Ibid, p. 373.

5 Lévinas, E., *Humanisme de l'autre homme*. Montpellier, Fata Morgana 1972.

to the realization of "the whole panorama of science [...] within a biology of man immersed in thought".[6] The study of life discovers the life of the mind.

Inevitably Polanyi takes recourse to the internal motivation of all psychological acts, that is, the impossibility of reducing psychic states to external triggers and bodily functions. Consequently, he rejects behaviorist and naturalist interpretations of living activity.[7] Therefore, he has to assume a level of the living that surpasses psychology and biology. In terms of science, the dimension of mutual acceptance that accounted for its social importance, its historicity, and its dependence on freedom makes it a "coherent system of superior knowledge",[8] of which the individual scientist is an integral part that depends on the whole.

For the biologist that entails that the study of life at some level becomes "self-modifying and thus eventually loses its observational character, to become a condition of pure indwelling".[9] Contrary to reductionist conclusions from natural sciences, particularly from animal behavior and psychology, Polanyi points out that the study of life inevitably reaches a level where it becomes self-referential for the studious person, and that such self-reference has to be taken into account rather than explained away.

Since objectivity does not mean distancing the observer from the object but finding rationality in the object, finding rationality in the rational person requires a stance 'superior' to the person, who at the same time is studying this rationality. This is a point where objectivity, epistemology, and everything connected with it, reach the ontological level. This ontological level by necessity transcends the human realm. This is a stunning conclusion: knowledge, in so far as it is rooted in the person, transcends itself. "Thus, at the confluence of biology and philosophical self-accrediting, man stands rooted in his calling under the firmament of truth and greatness."[10] We will have to come back to the term 'firmament'.

6 Polanyi, M., *Personal Knowledge*, q. w., p. 374.

7 Ibid, for example p. 372.

8 Ibid, p. 375. In this paper, we are less concerned with the societal dimension of science as discussed by Polanyi; on this see: Nye, M. J., *Michael Polanyi and His Generation: Origins of the Social Construction of Science*. Chicago, University of Chicago Press 2011.

9 Polanyi, M., *Personal Knowledge*, q. w., p. 378.

10 Ibid, p. 380.

Already in 1939 Polanyi maintained against state run research projects that "the whole spiritual realm of truth, justice, humaneness, beauty and their organizations in the forms of laws, politics, moral customs, arts, religion" can "grow only in accordance with their own fundamental principle".[11] The human "idiom of his thought" is derived from man's adherence to true objectivity; it is "the voice by which he commands himself to satisfy his intellectual standards [...]. It [...] grants him power and freedom to defend them."[12]

Consistent with this discovery that combines the personal approach and the growth of objective truth, a chapter on evolution, "The Rise of Man", concludes the book. It is here that Polanyi touches upon Pierre Teilhard de Chardin in *Personal Knowledge*.

Polanyi reviewed Teilhard's *Phenomenon of Man* (English 1959) with a mixture of sympathy and critique, mentioning that he had read the original French edition as it came out in 1955, while working on his own *Personal Knowledge*, being "profoundly moved by it".[13] He pointed out that Teilhard's book found wide acclaim, even by evolutionists like Julian Huxley (who authored an introduction to the English translation[14]), although the French thinker radically broke with the mechanistic theory of evolution that ascribes mutations to failures in the genes and propounded, instead, "active striving towards ever higher [...] forms of existence". Therefore Polanyi appreciates Teilhard's understanding that through the emergence of humans the universe illuminates itself and reaches for God. Science is accurate, in Teilhard, but only to the extent that the book is "an epic poem that keeps closely to the facts". That, however, explains also why scientists who pursue a mechanistic interpretation may equally be enchanted by Teilhard's ideas. To Polanyi, *The Phenomenon of Man* is only a "powerful pointer" for his own research.

From January through March 1961 he taught in Oxford a class on "Unspecifiable Elements of Knowledge", which included in its seventh meeting a section

11 Polanyi, M., Rights and Duties of Science. In: Polanyi, M., *Society, Economics, & Philosophy: Selected Papers*. Ed. R. T. Allen. London, Routledge 2017, p. 67.

12 Polanyi, M., *Personal Knowledge*, q. w., p. 380.

13 Polanyi, M., An Epic Theory of Evolution. Review of The Phenomenon of Man by Pierre Teilhard de Chardin. *Saturday Review* 43, January 30, 1960, p. 21.

14 Teilhard de Chardin, P., *The Phenomenon of Man*. Trans. Bernard Wall. New York, Harper Perennial 1965, p. 11–28.

on evolution. In the syllabus of that class he sketched out the link between personal determination to knowledge and freedom of society based on Teilhard's cosmology, which he classified as "biological terms". His outline[15] says, among others:

> "In terms of Teilhard de Chardin:
> the growth of thought in society is *noogenesis* which implies existence of a *noosphere*.
> [...]
> Biology, extended to the study of man's mental endeavours, utters the commands of human ideals.
> Such must be the logical endpoint of an adequate theory of evolution.
> It is from this endpoint that we recognize evolution as a series of rising levels of existence with an increasing wealth of intrinsic meaning."

The sketches point out that the spheres of the mind and nature refer mutually to each other; biology, and any other natural science, manifests ideals and ideas that are fundamentally human and thus constitute or transcend the human sphere. For this "increasing wealth of intrinsic meaning" is more than any number of persons can think, it drives the existence as such. For Polanyi there must be an ontological relationship between the human sphere and the transcendent realm. In Teilhardian terms, the genesis of mind implies and presupposes a sphere of mind beyond the human – this is what the professor taught at Oxford. For him that meant an interdependency of the epistemological level, as it is familiar to a natural scientist, and the metaphysical level that many scientists of his time neglected. Biology, properly pursued, cannot help entering the mental sphere in metaphysical terms. Shortly after that, he will state in a paper on the mind-body question: "Discovery or invention are, as it were, processes of spontaneous growth induced by the labours of the questioning imagination. Originality is deliberate growth." He continues by confirming that this is in agreement with Teilhard, namely, "his vision of

15 Typescript at Regenstein Library, University of Chicago, RPC, box 22, folder 14, unnumbered pages.

evolution as a continuous sequence of creative acts."[16] This amounts to taking understanding and development as ontological facts.

Biology, epistemology, and ontology relate to each other by way of inclusion. Reductionist theories aim at explaining higher levels on the basis (literally) of lower levels, which is fruitful for an understanding of the lower levels. But reductionism cannot disguise the fact that lower levels never fully explain the higher levels. "Lower levels do not lack a bearing on higher levels; they define the conditions of their success and account for their failures, but they cannot account for their success, for they cannot even define it."[17] Reductionism can overreach its competency by mistaking inevitable conditions for sufficiently creative powers. Around the same time Polanyi observed "all meaning lies in higher levels of reality that are not reducible to the laws by which the ultimate particulars of the universe are controlled."[18]

In addressing current theories of evolution Polanyi shows that the Neo-Darwinian approach is correct as long as it aims at describing the processes of adaptation in the natural world, but it needs to be complemented by a theory that accounts for the objective principles that guide evolution in the perspective of "achievement" that is to be reached.[19] In this context, Polanyi uses the concept of firmament.

In *Personal Knowledge* he states, "that biology is an expansion of the theory of knowledge into a theory of all kinds of biotic achievements, among which the acquisition of knowledge is one."[20] We should notice that it is not biology that generates epistemology; rather, knowledge properly valued moves over to the study of life in all forms to the effect that, secondarily, exercising understanding turns out to be the upshot of life. This is a circular observation (from knowing to living to knowing) that is not mistaken because it

16 Polanyi, M., The Body-Mind Relation [1968]. In: Polanyi, M., Society, Economics, & Philosophy, 2017, p. 328.

17 Polanyi, M., *Personal Knowledge*, q. w., p. 382.

18 Polanyi, M., *Scientific Thought and Social Reality: Essays*. Ed. Fred Schwartz. New York, International Universities Press 1974, p. 137f.

19 Polanyi, M., *Personal Knowledge*, q. w., p. 382–90; Cf. Paksi, D. Polanyi and Evolution. In: Margitay, T. (ed.), *Knowing and Being: Perspectives on the Philosophy of Michael Polanyi*. Newcastle, Cambridge Scholars 2010, p. 151–72; p. 160–166.

20 Polanyi, M., *Personal Knowledge*, q. w., p. 347.

aims at establishing the interconnectedness of research and object both on the epistemic and on the ontological level. In the same paragraph Polanyi, then, elevates the realm of science to the realm of transcendent reality that houses and directs all endeavors of a scientist: "ascending from the I-It to the I-Thou and beyond it to the study of human greatness, [generalization] will transform the biologist's relation to his subject matter to that between man and the abiding firmament which he is committed to serve."[21] Here we have in a nutshell the enterprise to present knowledge as personal by essence: the subject-object relationship of human approaches to the external world, being intimately personal, transforms objective science into a relationship of persons. Polanyi makes no further comments on that, but the entire book documents this mutual relationship of the rootedness of understanding in the person and the conviviality of the researcher with the researched objects that turn into subjects. Hence the wording of "from the I-It to the I-Thou". It is unknown to me whether Polanyi was inspired by Martin Buber, who wrote about *I and Thou* in the 1920s, but it seems likely that he is accepting at this point Buber's dialogical form of human relationship with the world.[22] This mutuality of subject and object, Polanyi states, is at home in an overarching 'firmament', to which the human endeavor is a requested service. Research

21 Ibid, p. 348.

22 On p. 346, Polanyi had introduced the I-It vs. I-Thou relationship within objective research; cf. also Polanyi, M., The Scientific Revolution. In: Polanyi, M., *Society, Economics, & Philosophy*, 2017, p. 329–43 (Buber not mentioned); Cf. Buber, M., *Ich und Du*. Leipzig, Insel 1923; Kelleher, W., Respect and Empathy in the Social Science Writings of Michael Polanyi. *Tradition & Discovery The Polanyi Society Periodical* 35, 2008–2009, No. 1, p. 8–32, cites this passage p. 32, note 11 without explanation; A comparison, without claims of dependency in: Whitehead, P., *The Mutual Epistemology of Polanyi and Buber: The Dissolution of the Subjectivity-Objectivity Dichotomy in Contemporary Inquiry Methodology*. Paper Presented at Interdisciplinary Graduate Research Conference in Columbus, GA on October 25, 2012 [accessed 1 February 2020]. Available at: https://www.academia.edu/7908429/The_mutual_epistemology_of_Polanyi_and_Buber_The_dissolution_of_the_subjectivity-objectivity_dichotomy_in_contemporary_inquiry_methodology; The same is the case in: Agassi, J., *Science and Its History: A Reassessment of the Historiography of Science*. Dordrecht, Springer 2008, p. 246–47; where both are juxtaposed without reference; Meek, E. L., *Loving to Know: Covenant Epistemology*. Eugene, Oregon, Wipf and Stock 2011, p. 259; touching on the I-You without reference to this quotation. Polanyi did not take the cue when asked about Buber in: Rogers, C. – Polanyi, M., Michael Polanyi and Carl Rogers: A Dialogue [1968]. *ETC: A Review of General Semantics* 72, 2015, No. 2, p. 219–26; p. 222f.

that is gnoseologically and essentially united in the person reveals a realm, within which it is ultimately possible.

From here it transpires that Polanyi's 'firmament' of ideas, standards, and obligations is a version of Teilhard's *noosphere*, as will be seen below. In all intellectual activities as much as they are self-referring to humanity "we can no longer think of ourselves as observers occupying, as such, a logical level above that of our object. If we can still distinguish two levels we are now looking up to our object, not down."[23] It is an essential feature of Polanyi's thought that obviously there is no knowledge without a knowing person; and even more importantly, potential objects of knowledge admit for degrees. Hence the twofold conclusion that knowledge has a history and anthropology transcends humanity. This combination of history (which is a process rather than a mere sequence of events) and anthropology (which is philosophical rather than empirical) makes Polanyi an ally of Teilhard. In his just quoted lectures *The Study of Man* (1959, that is, while editing his Gifford Lectures) Polanyi concluded a chapter on "Understanding Ourselves" saying "Thus our acknowledgment of understanding as a valid form of knowledge foreshadows the promised transition from the study of nature to a confrontation with man acting responsibly, under an over-arching firmament of universal ideals." Then he opened the following chapter on "The Calling of Man" turning this promise into "responsible decisions under a firmament of universal obligations".[24]

What we observe in these statements is the transition from a static worldview into a dynamic one; and since the 'firmament', the overarching sphere that houses all living processes, is not only transcendent but also guiding and demanding, this transcendence takes on the power of teleology.[25] In *Personal Knowledge*, when referring to Teilhard, Polanyi turns the scientistic interpre-

23 Polanyi, M., *The Study of Man*. Chicago, University of Chicago Press 1959, p. 97.

24 Ibid, p. 39 and 41. On potential pantheistic implications and the dialectics of demanding transcendence with immanence see Forster, P., Providence and Prayer. In: Torrance, T. F. (ed.), *Belief in Science and in Christian Life: The Relevance of Michael Polanyi's Thought for Christian Faith and Life*. Edinburgh, Handsel Press 1980, p. 108–32; p. 114–115.

25 A detailed account on the varieties of teleology in Gelwick, R., Michael Polanyi's Search for Truth: Michael Polanyi's Daring Epistemology and the Hunger for Teleology. *Zygon* 40, 2005, no. 1, p. 63–76.

tation of evolution into a teleological one that is founded in metaphysics. For "we can have no clear conception of living beings, as long as we insist on defining life in terms of physics and chemistry".[26] In a first step he turns the evolutionary basis of development into a framework of preexisting conditions, which are neither active nor sufficient for any explanation. Neo-Darwinism interprets "evolution as the sum total of successive accidental hereditary changes which have offered reproductive advantages to their bearers."[27] To the extent that in this kind of evolution events are accidental and just opportunities there is also no metaphysical foundation of things observed and interpreted.

The transition from empirical science to metaphysics goes along with the merging of principles of being and principles of understanding, as we would say in the Aristotelian tradition. Life is eventually culminating in mind. "(1) Living beings must be possible, i.e. there must exist rational principles, the operation of which can sustain their carriers indefinitely; and (2) favourable conditions must arise for initiating these operations and sustaining them."[28] 'Possible', here, means more than blind potentiality; it entails the power to exist. Life as it emerges from dead matter is a higher ontological form; and this higher stage of evolution must necessarily come about by obeying a higher principle, rather than being pushed somehow from below. The text continues: "In this sense I shall acknowledge that the *ordering principle* which *originated* life is the *potentiality* of a stable open system; while the inanimate matter on which life feeds is merely a *condition* which *sustains* life [...]."[29]

Without great fanfare, Polanyi is endorsing some kind of apophatic theology. For what he is saying is that there has to be an ordering principle that controls the development; but it is impossible to make any claims and positive

26 Polanyi, M., *Personal Knowledge*, q. w., p. 383.

27 Ibid, p. 382; The same applies to the acceptance of "random mutations", mentioned in the context of Teilhard's view on evolution, in: Polanyi, M., *The Tacit Dimension*. Chicago, University of Chicago Press 2009, p. 46.

28 Polanyi, M., *Personal Knowledge*, q. w., p. 383. For a comparison of Aristotle and Polanyi see: Hoinski D. – Polansky, R., The Modern Aristotle: Michael Polanyi's Search for Truth against Nihilism. In: Greenstine, A. J. – Johnson R. J., *Contemporary Encounters with Ancient Metaphysics*. Edinburgh, Edinburgh University Press 2017, p. 180–201.

29 Polanyi, M., *Personal Knowledge*, q. w., p. 383 f. (emphasis in the original).

classifications of that principle, so that it is merely *potentia absoluta*, related to which the evolution is the *potentia ordinata*. In comparison to that higher principle, empirical life and evolution are "random fluctuations and sustained by fortunate environmental conditions".[30] Since it is obvious that from a metaphysical and theological point random mutation and natural selection are not valid explanatory concepts but only *ad hoc* descriptions within the competence of natural empirical science, the "spontaneous rise of such incomparably higher forms of being testifies directly to the operations of an orderly innovating principle".[31]

Polanyi discusses at length the scientific value of emergence, emphasizing that we can only know of it on hind-sight; that is, we tend to interpret developments in nature and physical reality teleologically as we know the upshot while admitting that none of the higher levels could ever had been predicted from the starting level, so that "living beings [...] can be understood only in teleological terms"; and "[a]ll physiology is teleological". However, we have seen that this holds not only within the economy of empirical explanations, like the functioning of blood vessels, but in the overall system of the world.[32] When explaining the role of religion, Polanyi characterized his philosophical interpretation of natural science as "clue to God".[33]

> "Looking back from this point on the immensities of the past, we realize that all that we see there, throughout the universe, is shaped by what we now ultimately believe. We see primordial inanimate matter, the motions of which are determined whether mechanically or statistically by intrinsic fields of forces. We see its particles settling down into orderly configurations which our physical theories can trace back (however imperfectly) to the fundamental properties of inanimate matter. This universe is still dead, but it already has the capacity of coming to life."[34]

30 Ibid, p. 384.

31 Ibid, p. 387.

32 Ibid, p. 175 and 360 f.

33 Ibid, p. 285. On this quotation see the discussion: Gelwick, R., Science and Reality, Religion and God: A Reply to Harry Prosch. *Zygon* 17, 1982, No. 1, p. 25–40; Prosch, H., Polanyi's View of Religion in Personal Knowledge: A Response to Richard Gelwick. *Zygon* 17, 1982, No. 1, p. 41–48.

34 Polanyi, M., *Personal Knowledge*, q. w., p. 404.

With this summary Polanyi prepares the concluding statement of his entire book:

> "So far as we know, the tiny fragments of the universe embodied in man are the only centres of thought and responsibility in the visible world. If that be so, the appearance of the human mind has been so far the ultimate stage in the awakening of the world; and all that has gone before, the strivings of a myriad centres that have taken the risks of living and believing, seem to have all been pursuing, along rival lines, the aim now achieved by us up to this point. They are all akin to us. For all these centres those which led up to our own existence and the far more numerous others which produced different lines of which many are extinct may be seen engaged in the same endeavour towards ultimate liberation. We may envisage then a cosmic field which called forth all these centres by offering them a short-lived, limited, hazardous opportunity for making some progress of their own towards an unthinkable consummation. And that is also, I believe, how a Christian is placed when worshipping God."

In rather cautious language, Polanyi endorses an ultimate aim of the cosmos that as a principle transcending the evolving world remains unthinkable – while all the cosmos is akin to humanity in leading up to that preliminary consummation. We should note the correct and yet modest position when Polanyi does not claim that the ultimate perfection of the world and humanity is God,[35] but to think of it is equivalent to worshipping God.

Pierre Teilhard de Chardin

Let us have a look, now, at how Teilhard de Chardin interpreted evolution. In an essay on "The God of Evolution" he diagnoses:

> "Ever since Aristotle there have been almost continual attempts to construct 'models' of God on the lines of an outside Prime Mover, acting a retro. Since the emergence in our consciousness of the 'sense of evo-

35 This is the core message of Gelwick, R., *Michael Polanyi's Search for Truth: Michael Polanyi's Daring Epistemology and the Hunger for Teleology*, q. w.

> lution' it has become physically impossible for us to conceive or worship anything but an organic Prime-Mover God, *ab ante*."[36]

That is to say, the Aristotelian tradition tended to emphasize God as the efficient cause; and Teilhard comes to the same conclusion, as Polanyi will do, that in a scientific world that does not suffice anymore. To think in terms of evolution is equivalent to shifting the perspective from efficient to final causality. For Teilhard the theologian, the key problem is that the scholastic efficient mover is external to creation, whereas the evolutionary God has to be immanent in some form or "organic," as Teilhard terms it.[37]

Obviously, that preference for the teleological and organic conception of God smacks of pantheism. For, if there is any organic relationship between God and His creation, then God has to be in some way internal to the world. That is a genuine metaphysical implication of teleology: Ever since Aristotle's teaching of final causality in living beings, this cause coincides factually (if not conceptually) with the 'form' or essence of that which is being caused.[38] Therefore, Teilhard guarded himself against pantheism by way of re-interpreting it and then endorsing it. Pantheism in a Christian way is equivalent with the union with Christ:

> "We shall be saved, and we shall see God only in so far as we are one in Christ Jesus. The Incarnation ends in the building up of a living church, of a mystical body, of a consummated totality, of a *pleroma* [fullness] (to use St Paul's word that defies translation) [...]."[39]

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36 Teilhard de Chardin, P., *Christianity and Evolution*. Trans. R. Hague. New York, Harcourt 1971, p. 240; Note: *a retro* means pushing from the back; *ab ante* means drawing from the front; Cf. Salmon, J. F., Emergence in Evolution. *Foundations of Chemistry* 11, 2009, No. 1, p. 21–32. [accessed 3 February 2020]. Available at: https://doi.org/10.1007/s10698-008-9059-0

37 On antecedents in the history of sciences, when efficient causality had to be complemented by intention see the remark in: McMenamin, M. A. S., *Teilhard de Chardin's Legacy in Science and Theology. Cosmos & Creation XXIV Annual Conference.* Loyola College in Maryland, Baltimore, Maryland, June 10–12, 2005, unnumbered page 6. [accessed 4 February 2020]. Available at: https://www.academia.edu/39129648/Teilhard_de_Chardins_Legacy_in_Science_and_Theology

38 Cf. Aristotle, *Physics* II 3, 195a15–25; *Metaphysics* V, 1013b21–24.

39 Teilhard de Chardin, P., Pantheism and Christianity. In: Teilhard de Chardin, P., *Christianity and Evolution*, q. w., p. 67.

Such union, obviously, is a task, a promise, and an experience in the mystical realm; and as such the fullness lies ahead of any present Christian community. But it is also the driving force of community, and it is already present in the empirical world of any individual, any community, and the empirical world as such, precisely because a final cause can only 'draw' if it is factually living within the process of causation.[40] Therefore, for Teilhard the mystical is factual.

> "Without any doubt, we Christians can (and, indeed, what is much more, we must) understand the mystical union of the elect in Christ as combining the warm flexibility of social relationships with the imperative rigour and irreversibility of the physical and biological laws or attractive forces operating in the present universe."[41]

Teilhard's most famous book was his *The Phenomenon of Man*.[42] The book was written in 1940 and published in 1955. It presents an extended study of evolution, moving gradually from the material world ("Before Life Came") via the phenomena of life to thought as the culmination of the world as it is known. However, the book concludes with the stage that is termed "survival".

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40 On reality as process see: Barbour, I. G., Teilhard's Process Metaphysics. *The Journal of Religion* 49, 1969, No. 2, p. 136–59; 137–140.

41 Teilhard de Chardin, P., *Christianity and Evolution*, q. w., p. 69; On the ambiguities in reading Teilhard as pantheistic or otherwise see: McMenamin, M., Good Teilhard! Bad Teilhard! The Theological Treachery of Partial Scientific Truths. *New Oxford Review* 82, 2015, No. 6, p. 30–33; On the tandem of mysticism and science see: Duffy, K., *Teilhard's Mysticism: Seeing the Inner Face of Evolution*. Maryknoll, New York, Orbis Books 2014.

42 More recently, the title *The Phenomenon of Man* was translated as *The Human Phenomenon*, trans. Sarah Appleton-Weber (Brighton, Sussex Academic Press 1999). However, the difference is that of the grammatical function of the adjective in the French original *Le phénomène humain*: not the phenomenon has the property of being human, but the human is seen as a phenomenon. For instance, in a 1947 paper on Turmoil or Genesis, Teilhard discussed the proposition: "Proposition II. Human Reflection is not an Epiphenomenon of the Organic World, but the Central Phenomenon of Vitalization"; Teilhard de Chardin, P., *The Future of Man*. Trans. N. Denny. New York, Image Books/Doubleday 2004, p. 214; The new translator explained (p. xviii) "Teilhard's subject is not the 'phenomenon of man' as one among other species, but the ever evolving human phenomenon [...]. The human phenomenon is a unique biological, collective, and global phenomenon [...]." However, the comparison with other species is not at stake in the translation; the phenomenon discussed in this book is one to be compared with other phenomena, as listed in the quotation. Nevertheless, I am quoting the old translation in this paper plainly for technical reasons.

This is the terminology Teilhard uses to summarize his theory:

> "We saw geogenesis promoted to biogenesis, which turned out in the end to be nothing else than psychogenesis. With and within the crisis of reflection, the next term in the series manifests itself. Psychogenesis has led to man. Now it effaces itself, relieved or absorbed by another and a higher function – the engendering and subsequent development of the mind, in one word *noogenesis*. When for the first time in a living creature instinct perceived itself in its own mirror, the whole world took a pace forward."[43]

It is worth mentioning that Teilhard describes the stages of evolution with the term *genesis*. Genesis as we know it from the Bible is a long-term process from one level to the next. Each level springs from the preceding one. But more surprisingly, the new level is necessitated by the reflection of the sphere upon itself. So, on the one hand, the higher emerges from the lower; but on the other hand, the higher was entailed in the lower level and realizes itself by way of self-reference. It is as though matter was already thinking, in a way. By and by the higher stage liberates and absorbs the preceding one. Thus, none of the stages, life, soul, and thought negates the lower ones but does them justice in realizing the hidden potential. The mind that emerges in *noogenesis* is the actualization of what has been a potential in matter; the mind has been luring from the beginning of the world. This, of course, is nothing trivial; it is the miracle of creation in a nutshell. And, before we forget to mention it, the *noosphere*, the realm of man in the universe, is the temporary culmination of the teleology of creation.

Now, teleology in Christian terms amounts to eschatology. Teilhard assigns to the evolutionary process as it has been discovered by the sciences a theological interpretation. The emergence of the human sphere of thought is the culmination of the world, both in empirical and in temporal dimensions: humans are that part of the cosmos that is able to leave that same cosmos behind through the mental feature of reflection. That, however, did not happen on the first days of creation as told in the book of *Genesis* but rather on the last day. That is to say, the creation has an inescapable temporal dimension – inescapable, at least within the worldly realm. But with the genesis of human

43 Teilhard de Chardin, P., *The Phenomenon of Man*, q. w., p. 181.

mind, reflecting upon itself, yet another dimension appears: that of a-temporal eschatology, the sphere of salvation and of ultimate confirmation of the cosmos as a whole. (Remember pantheism.)

One decisive move in Teilhard's theory is to reverse the tendency to find the unity of the cosmos in some non-distinct whole. If the appearance of humans marks the highpoint of the process, then this cannot possibly end in "the extension of our being or of the noosphere in the Impersonal. The Future-Universal could not be anything else but the Hyper-Personal at the Omega Point".[44] There is – or, rather, there is coming – a final point, Omega, which is not at all impersonal and vague, but has to be individual. As individual as humanity by definition is. He calls that "personalisation". We will reflect on this term when comparing Teilhard with Polanyi. But first a few words on Omega, obviously the last letter of the Greek alphabet and as such used in describing the all-encompassing God as the Alpha and Omega. Here, Omega means the concentration of the whole in a unity that is not a monotonous hodge-podge. Unity that is organic is structured and intelligible. It is the end-point that gathers all individuals without abolishing their respective individuality. "A present and real noosphere goes with a real and present centre. To be supremely attractive, Omega must be supremely present."[45] Omega is the omnipresent principle of individuation in the human sphere of thought. It is the eschatological attractiveness that provides reality throughout the evolutionary process. As such it establishes both thought and individuality.

> "The universe is a collector and conservator, not of mechanical energy, as we supposed, but of persons. All round us, one by one, like a continual exhalation, 'souls' break away, carrying upwards their incommunicable load of consciousness. One by one, yet not in isolation. Since, for each of them, by the very nature of Omega, there can only be one possible point of definitive emersion – that point at which, under the synthesising action of personalising union, the noosphere (furling its elements upon themselves

44 Ibid, p. 260; Cf. Barrow, J. D. – Tipler, F. J., *The Anthropic Cosmological Principle*. Oxford, Oxford University Press 1988, p. 200–204.

45 Teilhard de Chardin, P., *The Phenomenon of Man*, q. w., p. 269.

> as it too furls upon itself) will reach collectively its point of convergence – at the 'end of the world'."[46]

So, we have a universe that is a oneness that is not plainly universal but as such establishing individuality of any material and organic part of it; and also we have a oneness that is the individual as a person. No surprise, then, that Christ is the incarnate unity and personality of the world.

> "Christ, principle of universal vitality because sprung up as man among men, put himself in the position (maintained ever since) to subdue under himself, to purify, to direct and superanimate the general ascent of consciousnesses into which he inserted himself."[47]

Christ immersed himself into the material and human world, thus making the emergence of humanity possible – metaphysically and also epistemologically. For humanity is impossible to exist and to be thought of without that level of existence that is independent of the material framework. Teilhard is well aware that he is not only preaching to the choir, he is also preaching to the traditional theologians of Christology, and at the same time he is preaching to the non-believers. To all of them he adds to the just quoted assurances:

> "By a perennial act of communion and sublimation, he [Christ] aggregates to himself the total psychism of the earth. And when he has gathered everything together and transformed everything, he will close in upon himself and his conquests, thereby rejoining, in a final gesture, the divine focus he has never left."[48]

Again and again, we see Teilhard operating dialectical arguments. For us it is important that the Omega point is more than an extrapolation from a given vector. It is the condition of possibility of a world that is both potential object of empirical research and the transcendence of merely finite thought. In a summary of his concept of Omega (1954) he combined the hypothetical with the metaphysical power:

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46 Ibid, p. 272.

47 Ibid, p. 294.

48 Ibid, p. 294.

> "To what extent [...] will humanity, in order to attain further co-reflexion and union, be led progressively to distinguish (outside all philosophy and for bio-genetic purposes) an 'amorising' kernel of the transcendent in the centre of an Omega at first regarded as simply immanent?
> The future will tell."[49]

In this passage, intended to define the specific phenomenon of Christianity, expectations and reality, immanence and transcendence, reflection and finality are so much interlinked that teleology appears plainly natural. Now, regardless whether one takes him as a metaphor or a reality, Christ is the embodiment of this dialectics. The best term to encapsulate such dialectics (preceding theological research) is *person*. In a note to the General of the Jesuits in 1948, Teilhard expressly described his method as "pendulum-like 'dialectic'", namely

"1. Observation of the Phenomenal World. Perception, purely experiential, of an infolding movement ('evolution') which causes the successive emergence of beings that are progressively more complicated organically and more centred psychically. – With Reflection (Man) the appearance of the need for irreversibility (for 'immortality') which postulates, if Evolution is to continue, the existence of a centre (super-personal and partially transcendent) of consistence: 'Omega'.

2. Re-Descent, starting from Omega. Once the existence of Omega is accepted, our minds have to accept two consequences:

a. First, that Evolution must be interpreted as a pull from above (and not merely as an immanent push).

b. Secondly, that an influence, by nature personal and free, emanating from Omega (Revelation) is not only possible but to be expected. – In the light of this, the significant value of the Christian Fact (or phenomenon)."[50]

49 Teilhard de Chardin, P., Complementary Remarks on the Nature of the Point Omega. Or, the Unique Nature of the Christian Phenomenon. In: Teilhard de Chardin, P., *The Appearance of Man*. Trans. J. M. Cohen. New York, Harper & Row 1965, p. 273.

50 Teilhard de Chardin, P, My Phenomenon of Man: An Essential Observation. In: Teilhard de Chardin, P., *The Heart of Matter.* Trans. R. Hague. New York, Harcourt Brace and Company 1979, p. 149–50; Two more items follow, regarding grace and redemption that Teilhard claims not to have addressed, yet. On the heart metaphor see: Salm-

We see Teilhard endorsing dialectic as the way to achieve the Christian revelation as that of reflection upon reality that gives personal salvation and freedom.

From Pavel and Karel Floss I learned that Teilhard's thought was welcomed by dissidents in then Czechoslovakia around the Charta 77, specifically Jan Sokol, who also translated Teilhard into Czech. In a reminiscence of his encounter with Teilhard's work, he notes that Teilhard's unorthodox theology fostered dialogue among those who resisted communist pressure and felt independent from both scientistic and religious dogmatics.[51]

This is, incidentally, akin to where Michael Polanyi and Teilhard de Chardin meet: Polanyi engaged in destructing the myth according to which empiricism and deterministic rationalism is all there is. His intended audience were fellow scientists and their consumers who were eager to blur over the unaccountable in every research and even in every knowledge. He discovered knowledge to be personal in the sense of being grounded in the person of the knower and in the sense of operations of the mind that as such are not operable or formalizable. (That is, they fundamentally escape predictable forms.) From there he moved over to the societal framework that makes science, and knowledge in general, possible. This led eventually to understanding that the human mind is the upshot of an evolution that was unpredictable from the very beginning, which then opens the expectation of an ultimate completion. In this way Polanyi progressed from the world of science to the world of eschatology. His entire philosophy can still aptly be captured with the term "person". For it is not only the unfathomable human person who is thinking and living; the entire sphere of humanity and transcendence gains the meaning of person if we

on, J. F. – Schmitz-Moormann, N., Evolution as Revelation of a Triune God. *Zygon* 37, 2002, No. 4, p. 853–71; p. 862–863.

51 „A právě z této vnitřní spřízněnosti pod stálým, i když decentnějším tlakem komunistické moci mohl vzniknout zvláštní fenomén ‚dialogu', v němž zase hrál Teilhard významnou úlohu, nejenom pro nás. Trochu paradoxně nás sbližoval s živějšími marxisty, kteří se také velmi opatrně pokoušeli zbavit krunýře povinného myšlení, a na druhé straně byl Teilhard tím ‚trojským koněm' (Dietrich von Hildebrandt), kterého se báli konzervativnější katolíci a na kterého naopak sázeli zavilejší ateisté." Sokol, J., Teilhard tehdy a dnes. *Teologie a současnost*, 3, 2005, č. 2 [accessed 3 February 2020]. Available at: http://www.jansokol.cz/2014/03/teilhard-tehdy-a-dnes/

include in that concept not only the inscrutable individuality but also the mutuality between people and between the authority and those being cared of.

The French paleontologist had the agenda throughout to explain the long-term history of the world as a teleological progression for the initially simple reason that only teleology makes a movement from basic to complex levels meaningful and epistemologically explainable. Therefore, the human sphere of intelligence appears to be the natural outcome of the world. But Teilhard could not stop there, because even the trans-material scientific world must reflect upon itself and therefore point beyond itself. However, this transcendence is metaphysically as well as gnoseologically valid only, if it is also realized in that finite intellectual world. The enigmatic reality of that thought is Christ, the incarnate word of God. In Christ not only God became man, Christ was a person in the full sense of the word. Therefore, on a partly different trajectory, both the Hungarian and the French thinker discovered knowledge to be essentially personal.

SUMMARY:

Teleology in Pierre Teilhard de Chardin and Michael Polanyi

Pierre Teilhard de Chardin (1881–1955) and Michael Polanyi (1891–1976) are known for their study of the philosophy of science beyond traditional empiricism and positivism. Teilhard aimed at a guiding principle of all reality, while Polanyi emphasized the personal component in research. Both employed teleology as the method to describe the epistemic, physical, and spiritual quest. The ultimate aim of reality is transcendent, and science converges with worship. Thus for both, knowledge is fundamentally personal.

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