

REALITY AND ITS HIERARCHY

Polanyi's Critics on Material Reductionism

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Abstrak

Untuk menjawab kecenderungan ilmu-ilmu modern yang menciutkan segala sesuatu kepada hal-hal yang material, Michael Polanyi menawarkan sebuah alternatif pemahaman realitas. Menurut Polanyi, ada hirarki kenyataan. Suatu realitas dari tingkat yang lebih tinggi tidak dapat direduksi pada tingkat yang lebih rendah. Misalnya, kesadaran tidak dapat dijelaskan dengan hukum-hukum fisika dan kimia yang terjadi pada otak. Pengetahuan menyeluruh tentang setiap bagian dari suatu kenyataan, tidak dapat menjelaskan keseluruhan kenyataan tersebut. Dalam cahaya pemahaman kenyataan seperti itu Polanyi membela adanya realitas metafisis dan spiritual yang harus diakui bila martabat manusia ingin dihormati.

Key Words: *reality, science, reductionism, hierarchy, material, physics, chemistry, human being, metaphysical and spiritual reality, level.*

Introduction

Science tends to explain realities in the framework of *one-level* world, that is in terms of material things. Modern science has successfully restricted our interest within the context of mechanical language. Everything is to be explained as mere materials. Even consciousness has to be understood in this framework. In this perspective there is no place for any metaphysical and spiritual aspect. This, for Michael Polanyi, is unacceptable. He opposes this position by presenting a different feature of realities. Using his idea of knowledge, the tacit knowledge, Polanyi arrives at the idea of a many-level world. Reality is seen in a hierarchical structure, which implies that a reality of a higher level cannot be totally explained in terms of its particulars. The process of evolution is also understood in this perspective. For in every phase of evolution there exists a new principle which is not present in its precedent phase. In the light of this idea the reality is far more rich than just described in the materialistic doctrine. For Polanyi, real thing means something which has the capacity to reveal itself indeterminately in the future. The most important label of reality then, is its deep aspects, its potential manifestations, which are ready to be discovered and, if discovered, will open possibilities for further discoveries.

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Within this idea of reality an acceptance of a metaphysical reality is now possible.¹ The metaphysical reality has to be seen in the framework of the emergence of the higher entity from the lower one that brings us to the rising of a living thing capable of pursuing the universal intent and feeling responsible. Such universal intents are something that scientists, who admire the pure objectivity and detachment, have to get rid of.

In this article I present Polanyi's approach to this subject. His anti-reductionistic position is shown as an integral part of his intent to recover the dignity of man attacked by the materialistic interpretation of reality. So, after explaining the hierarchy of reality I highlight its relevancy to demonstrate the greatness of human dignity. Finally, I present my investigation of how such an idea leads to an acknowledgement of the metaphysical reality. The works in the notes without the name of the author are all Polanyi's works.

The Hierarchy of Reality

The structure of tacit knowing according to Polanyi, tells us something about reality.² Within this frame the world can be understood as a "universe filled with strata of realities, joined together meaningfully in pairs of higher and lower strata."³ In the light of this view Polanyi understands life as an emergence requiring the involvement of a higher principle more than merely physics and chemistry. He showed that the laws of physics and chemistry in themselves fail to explain the emergence of life. It is even more obvious in conscious being, especially in man endowed with universal intent. Polanyi's aim is to show the fallacy of reductionistic view which presents reality as a one-level world and explains everything in terms of the laws of physics and chemistry, in terms of material in motion. With this discernment he is ready to show the greatness of human being and to recognise the metaphysical reality.

The Many-Level World

Through his elaboration of the strata of realities, Polanyi gives a fresh understanding of a many-level world. It is an ontological explanation based on his theory of knowledge. With this explanation he shows the fallacy of the reductionism which tends to explain everything in a one-level framework. There is a strata of realities, he argues. Though the lower level provides a necessary condition for the existence of a higher level, the higher level cannot be totally explained in terms of the lower one. There is a boundary condition and a principle of marginal control operating in an emergence of a new level of

¹In Polanyi's thought metaphysical reality includes all the targets of our ideal statements, such as truth, justice and morality. They are all realities that cannot be reduced, as done by the current science, to physics and chemistry, and ultimately to forces acting between atomic particles.

²*The Tacit Dimension*, 34.

³*The Tacit Dimension*, 35.

existence. This discernment leads us to the idea of the teleological orientation of things.

Against Reductionism

Under the admiration of a detached and objective knowledge as the ideal knowledge, there is a craze for holding a reductionistic view of reality. Such is the trend prevailing in our time especially in science which claims that everything can be exhaustively explained without referring to any aspect of reality which is unverified by science. Polanyi reminds us of the danger of such an idea. It is claimed that science has to talk about real things; while real, in such ideas, exclusively means demonstrable and measurable. This claim is prompted by the view of a one-level world, that everything ought to be explained in terms of physical and chemical structure. We are now dominated largely by the strong feeling that what is really true is the universe of atoms and motion. There is a tendency to admire physics and chemist as the ideal approach to reality.⁴

Polanyi sees the Laplacean vision as a model of the most ambitious reductionism. According to Laplace a complete knowledge of the universe can be gained through the knowledge of primary qualities containing of the masses, positions, velocities, and forces of ultimate particles.⁵ This left us not just a very cold idea of reality in a mechanical reductionism, but also an impossible one. The knowledge of particulars of a comprehensive entity cannot provide us with the exact knowledge of the entity. This is the very core of Polanyi's argument against reductionism which tries to explain everything in terms of physics and chemistry.⁶

Polanyi takes machines as illustration of his position.⁷ In the concept of a machine there involves a certain purpose that does not present in its material particulars. There involves also the operational principle that cannot be explained in terms of physics and chemistry. They are the important factors in machine which do not derive from physics and chemistry. Hence there are some additional principles. Physics and chemistry, at the most, prepare potential elements to be used as particulars for a joint purpose but not determine it. This

⁴*Personal Knowledge*, 6.

⁵*Meaning*, 25; and in 29 Polanyi writes: "Laplace affirmed that if we knew at one moment of time the exact positions and velocities of every particles of matter in the universe, as well as the forces acting between the particles, we could compute the positions and velocities of the same particles at any other date, whether past or future. To amind thus equipped, all things to come and all things past would stand equally revealed. Such is the complete knowledge of the universe as conceived by Laplace." The context of this quotation is Polanyi's objection against the position held in science that scientific knowledge has to get rid of every kind of personal participation.

⁶*Personal Knowledge*, 329

⁷D. SCOTT, *Michael Polanyi. A Clear and Lively Account of His Ideas*, London 1996, 115.

is an example which describes the fundamental understanding of a hierarchy of reality rather than a one-level one as held by the reductionistic view.⁸

Biology is one of the significant domain that is so largely and intensively dominated by the influential reductionism. There is a great tendency to explain even the reality of life in terms of physics and chemistry.⁹

Indeed, there is reason why such an assumption has to be considered as non-sense. Polanyi's arguments against such an idea can be shown through the logical consequences that leads such an assumption to a meaningless affirmation. If every thing has to be reduced to the forces acting between atomic particles, then nothing else can be claimed to be meaningful. No life, no arts, no human being, no works of man can still exist against such an idea. Neither the idea itself can escape from such a program of elimination. If reality is no more than physical and chemical process, then every claim about reality is to be shattered immediately, for it cannot escape from the trap which it builds. Of course, it is inconceivable to think that the *Hallelujah* of Händel was no more than the interaction of atoms and physical necessity. It is so strange to consider it as the result of accident and necessity as Jacques Monod holds.¹⁰

The main ambition of reductionism in science today is to present reality in terms of ever more minute and minimal number of entities. Accordingly, we know ontological reductionism which claims that there is but one substance or world stuff and that this is material. There is also methodological reductionism which claims that researchers should always look for explanations at the lowest levels of theoretical description, ultimately at the level of atoms and molecules or other elementary particles that make up the objects being studied.¹¹ There is no doubt, Polanyi admits, that such a reductionistic explanation at certain sense

⁸*Personal Knowledge*, 329.

⁹*Meaning*, 25.

¹⁰Jacques Monod admired the notion of antique Atomism expressed by Democritus who said, that everything in the universe was but the result of accident and necessity. Monod accepted scientific method as the only approach which gives the true knowledge of nature. While its method requires objectivity and demonstrability of the object, he refutes every idea of a *final cause*, let alone the idea of project. This position is based on his assumption of the objectivity. He holds that, outside the mathematics, purely formal, a true knowledge can be acquired only through observation and scientific experiment. This idea is obviously untenable, for it is based neither on mathematics nor observation or experiment. (See M. LECLERC, *Il destino umano nella luce di Blondel*, Assisi 1993, 160.)

¹¹T. HONDERICH, ed., *The Oxford Companion to Philosophy*, Oxford – New York 1995. In this work reductionism is divided in three division: "Ontological reductionism refers to the belief that the whole of reality consists of a minima number of entities or substances [...] often the claim is meant in the more metaphysical sense that there is but one substance or "world stuff" and that this is material". "Methodological reductionism claims that, in science, "small is beautiful". Thus the best scientific strategy is always to attempt explanation in terms of ever more minute entities."; see also F.J. TIPLER, *The Physics of Immortality. Modern Cosmology. God and the Resurrection of the Dead*, New York 1995, 294-299.

helps us to understand reality. Nevertheless, it has been noted how the intensive attention focused on particulars destroys our comprehension of its focal meaning.¹² Polanyi then seems to say that in our knowledge of a comprehensive entity, embodying a rule of rightness, any information supplied by physics and chemistry can play only a subsidiary role.

Philosophical thought of Polanyi is motivated on humanitarian grounds. Accordingly, his objection against reductionism has to be considered in this context rather than merely as an interest of a more satisfying speculation. Reductionism, in his opinion, is the source of so many human sufferings in our time. It is the cause of our corruption of the idea of man, reducing him either to an insentient automaton or to a bundle of appetites. That is why science denies us the possibility of acknowledging personal responsibility and why science can be invoked so easily in support of totalitarian violence.¹³

The obsession for experiential facts which are measurable and observable prompts scientists to get rid of every kind of metaphysical reality and religious dogma. Polanyi openly accuses the Viennese school as the supporter of such fallacies.¹⁴ In such a positivistic view there is no ground for an ethical statement. “No conceivable occurrence, no measurement or observation, can decide whether any action is moral or immoral, just or unjust, good or evil.”¹⁵ If so, how can we prove, in scientific terms, that saying a false testimony is wrong? How can we get the meaning when one protests or intervening to stop others from doing distressing things?

Such a trend is adopted in the study of society, for example in anthropology, which describes social events in strictly scientific terms. The anthropologists then, in carrying out their analysis of society, are reluctant to imply the category of good and evil for they cannot be proved scientifically. In some anthropological explanations, for example, a cruel murder of supposed witches is explained as a cultural achievement and head-hunting as fulfilling an essential function in the societies in which they are practised.¹⁶

In order to avoid the dangerous consequences to humanity spread by such an attitude in science, Polanyi insists, there is only one choice, that is the recognition of metaphysical reality, irreducible to material elements.¹⁷ Hence, the reality has to be understood in a new way which regards a multi-level world

¹²*Personal Knowledge*, 330.

¹³*Meaning*, 25.

¹⁴*Meaning*, 27.

¹⁵*Meaning*, 27.

¹⁶See *Meaning*, 26. Polanyi refers to Clyde Kluckhohn who says, that some social systems are much more efficient than others in directing aggression into oblique or non-disruptive channels. But there is no doubt, according to Kluckhohn, that witchcraft is Navaho culture's principal answer to the problem that every society faces: how to satisfy hate and still keep the core of society solid. The same criticism is aimed at Gordon Childe who describes the motive of head-hunting in Eddystone Islanders in terms of a motive for living and keeping their economic system functioning.

¹⁷*Meaning*, 24.

which in its turn shows the “existence of a value that is absent from the constituent particulars.”¹⁸

The Strata of Realities

In chapter two of his *The Tacit Dimension*, Polanyi asserts his ambition to show “a picture of the universe filled with strata of realities, joined together meaningfully in pairs of higher and lower strata.”¹⁹ The same intention is expressed in the introduction to the part four of his *Personal Knowledge*.²⁰ Polanyi accepts the evolutionistic view of the world and living things, but he considers them not just as fruit of chance and accident.

The hierarchy structure of a reality is evident in the structure of tacit knowing. In dealing with a coherent entity, we tacitly involve two terms. Polanyi calls these as two terms of an act of tacit knowing, namely the proximal term including the particulars, and the distal one that is the comprehensive meaning. The two terms, in Polanyi’s view, can be seen as two levels of reality controlled by distinctive principle. Between the first and the second term there is an asymmetric relation in the sense that the principles controlling the comprehensive entity ever rely for their operations on laws governing the particulars of the entity, while the laws governing the particulars in themselves will never explain the organising principle of the comprehensive entity which they form. It is for that reason that Polanyi calls the comprehensive meaning as the upper or higher entity and the particulars as the lower.²¹

We can easily find examples for such a hierarchy of reality other than the example of the machine. A town planner, for example, relies on its successive lower levels. He relies, on the first place, on the architect, while the architect relies on the brickmaker’s work. Below the art of making bricks there serve the raw materials. So, a town planning contains at least four successive levels that correspond to four successive levels of rules. The raw materials of the bricks are governed by physics and chemistry; technology uses these laws to make bricks; architecture helps the builders; and the rules of town planning gives direction to the town planners. Polanyi gives another example, that is the giving of a speech. He demonstrates five levels in such an action each of them governed by its own laws. They are the production of voice, of words, of sentences, of style, and of literary composition; while their corresponding laws are phonetics, lexicography, grammar, stylistic, and literary criticism.

These examples show us a hierarchy of comprehensive entities with their relation to the higher and to the lower level. The lower provides the possibility for the next higher levels, while the higher one gives shapes to the lower by controlling its principles. In the case of producing the speech we can say that the voice is shaped into words by vocabulary; in its turn vocabulary is shaped

¹⁸*Personal Knowledge*, 327.

¹⁹*The Tacit Dimension*, 35.

²⁰*Personal Knowledge*, 327.

²¹*The Tacit Dimension*, 34.

into sentences in accordance with grammar. The sentences can be fit into a style which in its turn is made to convey the ideas of a literary composition.

Polanyi recognise here a dual control involving in each level, namely first, the laws that apply to its elements in themselves and, second, the laws that control the comprehensive entity formed by them. The latter cannot be accounted for by the laws governing the first, for, as Polanyi writes, “the operations of a higher level cannot be accounted for by the laws governing its particulars.” The vocabulary cannot be derived from phonetics; the grammar of a language cannot be derived from vocabulary; while the correct use of the grammar of a language does not mean we speak or write in a good style. They belong to different levels, hence every level has certain operations that are absent in the lower entity. A higher entity, according to Polanyi, has a more complex structure than the lower one, for the lower plays but a subsidiary role in the whole.

Boundary Condition and Principle of Marginal Control

If a reality relies for its operation on the laws governing its particulars, how can it fail to be determined by these laws? If a machine has to obey the laws of physics and chemistry, how can it fail to be explained in terms of physics and chemistry? How can the details of voice fail to represent the whole reality of language? “Does it not follow then that it must be possible to represent all their workings in terms of these laws?”²² These questions are launched by Polanyi to show the limits of reductionist tendency of objectivism. The system of dual control is proposed by Polanyi to explain the relation between different levels of comprehensive entities or performances. Each level is controlled by both its own laws and those of the next level above.

It has been said that the relation between these two levels is not symmetrical.²³ This means, according to Polanyi, that the laws of each level of reality leave open certain limits within which they operate. Polanyi calls these limits the *boundary conditions*.²⁴ In fact, he demonstrates in many ways the existence of an hierarchical organisation of being which he maintains ensued from pyramiding sets of boundary conditions.²⁵ It is an original term of Polanyi which is very important in his understanding of knowledge and reality. The term is borrowed from physics but he gives it a wider meaning. He means with it a series of conditions left undetermined by the laws of nature. The determination of these undetermined laws can be imposed on matter by natural process or by artificial intervention. Accordingly, we can see different principles that apply to a variety of circumstances. They can be a law of nature, as the laws of physics and chemistry, or be principles of operation, like those of machine and physiology. They can be also principles laid down for the

²²*Knowing and Being*, 216.

²³See *Personal Knowledge*, 331.

²⁴See *The Tacit Dimension*, 40; see also *Knowing and Being*, 216-217.

²⁵H. PROSCH, *Michael Polanyi. A Critical Exposition*, New York 1986, 132.

use of artefacts as we have in the use of a language or in the rules of chess.²⁶ Accordingly, an inanimate system can be subject to a dual control on two levels. In the case of the machine, for example, “the operations of the upper level are artificially embodied in the boundaries of the lower level which is relied on to obey the laws of inanimate nature, i.e., physics and chemistry.”²⁷

While the lower level leaves open its boundary conditions undetermined, the organisational principle of a higher one exercises on them a principle called by Polanyi *the principle of marginal control*. This principle controls the boundaries left undetermined by the next lower level. The production of voice, as the lowest level of speech, leaves largely open the possibility to be combined into words, which is controlled by a vocabulary. The vocabulary in its turn leaves largely open a boundary to be harnessed by the laws of grammar in creating sentences. That does not mean the laws of the lower level lose their role. Contrarily, Polanyi asserts, each lower level imposes restrictions on the one above it.²⁸

The laws of nature remain while it leaves its boundary open. Exercising the principle of marginal control over this boundary can be done only by respecting the laws of nature or, more generally, the laws of the lower level.²⁹ Man shapes the structure of machines and the working of their structure. Nevertheless, the material and the forces that operate them obey the laws of inanimate nature.³⁰

Every level of reality obeys the laws of its next lower level. It is made possible by these laws, and at the same time is given limits by the same laws. On the other hand, the principle of marginal control is something different to this level. It is imposed from outside for the purpose outside those laws³¹. The

²⁶See *Knowing and Being*, 216.

²⁷*The Tacit Dimension*, 40.

²⁸*The Tacit Dimension*, 41; See also *Knowing and Being*, 41. Here Polanyi writes about the boundaries harnessing the laws of inanimate nature. He explains: “This harness is not unbreakable; the structure of the machine and with it its working can break down. But this will not affect the forces of inanimate nature on which the operation of the machine relied; it merely releases them from the restriction the machine imposed on them before it broke down.”

²⁹*Knowing and Being*, 41

³⁰*Knowing and Being*, 225.

³¹There might be a confusion about the terminologies “boundary conditions” and the “principle of marginal control”. In *The Tacit Dimension* the two terminologies (the boundary conditions and the principle of marginal control) are described as belonging to different levels. Polanyi writes explicitly: “These principles [namely the principles of marginal control] may be said to govern the boundary conditions of an inanimate system—a set of conditions that is explicitly left undetermined by the laws of nature.” (40). This distinction is parallel with the description given in *Knowing and Being*: “[...] the boundary conditions of a principle are in fact subject to control by other principles. These I will call higher principles. Thus the boundary conditions of the laws of mechanics may be controlled by the operational principles which define a machine [...]” (217). In the same work (225) he uses the ‘boundary conditions’ to describe the ‘principle of marginal control’ as defined in *The Tacit Dimension*. He writes, for

laws of the lower level, though they remain in operation, are blind to this purpose, so that the higher entities are irreducible to them. Hence no description of a comprehensive entity in the light of its lower principles can ever reveal the operation of its higher principles.³²

Teleological Orientation of Things

The idea of the orientation of things is one of the most strange idea for modern thought. Scientists feel obliged to get rid of such concept for it cannot be proved through the scientific method dominated by empiricism and positivism. It has been proclaimed by Democritus, that everything in the world is no more than as the result of chance and necessity.³³ It means that the idea of a purposive world is necessarily excluded. Jacques Monod, of our age, takes the same position in his effort to replace the simple explanation of the world in terms of orientation and purpose in a mechanistic explanation. Natural phenomenon, in his opinion, can be explained in terms of mechanical cause without any reference to the “causa finale”.³⁴

The world described in such a way is, of course, a world without any meaning. It is a world which is no more than the collision of atoms and revolves around the mechanical events. The consequence of such a view is that the world is value-free as existentialists hold. Polanyi, on the contrary, realise the world as a meaningful one. In fact, his thought can be seen as a continuous struggle for recovering the meaning of the world and of human experience. He refers to the representative element in all religious orientation which portrays the world as meaningful.³⁵ Here his idea of the particulars and the comprehensive entity or performance within the idea of the hierarchy of reality finds its application. He admires Socrates’ wise position holding that “the world cannot be thought of as ultimately meaningful unless the organization of its parts is meaningful, that is, unless there is some point to the way things are put together or, at least, to the direction in which they are developing [...] Some intelligible directional lines

example, as a title of one section: “Boundaries Harness the Laws of Inanimate Nature”. Again he adds: “We may borrow a term from physics and describe both these useful restrictions of nature as the imposing of boundary conditions on the laws of physics and chemistry.” (226). Here Polanyi does not make a distinction between the boundary conditions and the principles of marginal control. Nevertheless, I prefer to follow the distinctions defined in *The Tacit Dimension*, for it gives us a clear idea of the hierarchy of realities, that is that the boundary conditions belong to the lower level left undetermined, while the principles of marginal control belong to the higher that gives the determination to the boundaries.

³²*Knowing and Being*, 217.

³³In Democritus cosmology, a chance concentration of atoms in empty space begins a circular motion impelled by collisions. The motion becomes a vortex surround by spherical membrane, within which a cosmos, or world, is formed. (See MAUTNER T., ed., *A Dictionary of Philosophy*, Oxford 1996, 97-98.)

³⁴See M. LECLERC, *Il destino umano nella luci di Blondel*, Assisi 1993, 60-61.

³⁵*Meaning*, 161.

must be thought to be operative in it.”³⁶ It is, indeed, a principle foreign to physical and chemical interactions.

Accordingly, a meaningful world has to be thought of as something more than just as the result of an orderly and rational interaction of forces. Anaxagoras seems to take a different position when he says that the material elements—namely air, ether, and water—were the cause of all things, although he had claimed to show how Mind was the arranger and cause of all things. Polanyi refers to Socrates’ disappointment against such a view that ascribes no causal power in the ordering of things.³⁷

Indeed, the recognition of order in the universe is insufficient to find the world meaningful. Polanyi has an abundance of example to show it even from our modern time. The view that the world is absurd, he argues, cannot be held as a consequence of the idea that the elements in it are not orderly related to one another. Such an orderly relation is in fact easily observed. So, Polanyi writes: “We think the world is absurd because it seems to us that there is no point to what transpires in it, i.e., that there is no end or aim or purpose to the whole business. It seems to us that there is no meaning to the universe—except possibly the subjective meaning that man tries to import into it.”³⁸ It is of course a tragic world, for if the meaning was no more than subjective, the universe will cancel it out.

The sharp opposition between science and religion prevailing in our contemporary mind cannot be separated from the fact of how science sees the idea of a teleological view of the cosmos. It started with the scientific explanation in a reductionistic base explaining the world as merely atomic elements acting blindly in terms of equilibriums and forces. According to Polanyi, it is the source of every suspicion against the ideal that leads to the accusation as unscientific and woolgathering every sort of teleological view of the cosmos.³⁹

Some new philosophical movements which launch the opposition to science still inherit the anti-teleological idea from science. Polanyi accuses, for example, existentialism as an attempt to oppose any sort of cosmic purpose on the ground of its demand for freedom and antideterminism. A purpose and determination, in the language of existentialism, means a limitation of freedom, so in the sphere of the freedom of men, there must be no fixed purpose.⁴⁰

³⁶*Meaning*, 161.

³⁷*Meaning*, 161; See also F. COPLESTON, *A History of Philosophy*, I, Doubleday, New York 1993, 71.

³⁸*Meaning*, 161-162.

³⁹*Meaning*, 162.

⁴⁰A purpose can be understood if there is a subject who establishes it. In Sartre’s view the idea of human and cosmic purpose is related to the idea of God, so the idea of freedom requires an atheistic consequence. In the absence of God, who created man for a purpose or a determinate goal, he argues, man is free to follow his choice. Man is free for, in such a situation, there is no given moral order to which man can appeal to justify his choice. The idea of determinism then has no place for him. See J.-P. SARTRE,

According to Polanyi, admitting a teleological aspect of the universe does not necessarily suppose a complete determination of every structure and occurrence in the universe. However, the objection of materialistic and mechanistic atomism lies in this point. Polanyi, therefore, especially thanks Charles S. Peirce and William James for their offering against what he calls a looser view of teleology.⁴¹ He notes we are now ready to suppose a presence of some sort of intelligible directional tendencies operative in the world without supposing they determine all things.⁴² He sees also Whitehead's view modelled on Plato's idea of "Good" as a support to such a position. Whatever they call it, those who hold a teleological orientation of things in the world suppose an external principle working in the chain of events.⁴³

This should be an alternative to the polarities between the views of the blind mechanical necessity and total freedom. However, Polanyi is disappointed that such an alternative solution has hardly an echo in our contemporary minds. We in the modern world, he notes, seem used to the opposed polarities, and accordingly to the notion that the world is simply absurd and hence the idea of a teleological orientation has no meaning.

The idea of the evolution of living organism is one of the most influential views responsible for the denial of a purposeful world. Since Darwin, the mechanical explanation of the species dominates any other explanation. The idea of purpose is then reduced to the terms of natural selection, and biology incessantly provides us with mechanical explanation of the life process by reducing it to chemical and physical interactions. It is clear that Polanyi regrets also the completely behavioristic approach to animal and human psychology which admires only the empirical data of a behavior without recurring to its deeper dimensions. In their discussion of animal and even human behaviour, behaviourists wish to abandon every idea of purpose or aim. For them the idea of teleological orientation seems to be a dirty and unscientific word.⁴⁴

Polanyi recalls the situation before these aggressive tendencies, when the "teleology" had not become a dirty word such as in our time. At that time, writes Polanyi, "living organisms, at least, seemed to be purposeful in their organisation (an integrated structure of functioning organs and tissues) and in

L'existentialisme est un Humanisme, Paris 1954, 36-37. Using Dostoïewsky's words, he writes: "Si Dieu n'existait pas, tout serait permis." C'est là le point de départ de l'existentialisme. Un effet, tout est permis si Dieu n'existe pas, et par conséquent l'homme est délaissé, parce qu'il ne trouve ni en lui, ni hors de lui une possibilité de s'accrocher. Il ne trouve d'abord pas d'excuses. Si, en effet, l'existence précède l'essence, on ne pourra jamais expliquer par référence à une nature humaine donnée et figée; autrement dit, il n'y pas de déterminisme, l'homme est libre, l'homme est liberté."

⁴¹See *Meaning*, 162

⁴²See *Meaning*, 162

⁴³*Meaning*, 163.

⁴⁴*Meaning*, 162.

their operations and their ecology as well.”⁴⁵ He admits that such a view is considered today as an absurd idea, so that any attempt to re-establish the idea of a purposeful world has to deal with the very core of the problem, namely the claim of physics and chemistry. For that purpose, Polanyi continues his argument by analyzing the presence of life.

The Presence of Life

The ambition of modern science to explain everything in materialistic terms finds its culmination in its effort to reduce life and consciousness to merely facts of physics and chemistry. Modern science has successfully restricted our interest within the context of mechanical language. According to Michael Polanyi, this is the core of the refutation of any sort of purposeful orientation.⁴⁶ He does not deny the importance of those elements in living things. In fact our knowledge of them help us to understand the process of life and to deal with certain aspects of its failure. What he refutes is the restriction of life in terms of physics and chemistry.⁴⁷

Machine-Like Explanation of Living Things

The fact that the process of life relies for its operation on the laws of physics and chemistry has prompted some biologists to accept a machine-like explanation of living things. For them, an organism is no more than a sophisticated and complex machine that can be, sooner or later, reduced to a physical and chemical explanation.⁴⁸ Such an assumption applies also to reality possessed by living things such as consciousness. For Polanyi it is a pity, that such an explanation is taken for granted by most intelligent opinions today. Encouraged by the fact that some “intelligent” machines can substitute human performances, and even do it more effectively, we are now ready to assume that one day human being can be substituted by machines, and that whole aspect of living things will be controlled and determined by science and technology.

Polanyi opposes this assumption for two reasons. First, for such a notion is dangerous, since it contains a logical basis for the lack of respect for life and for human beings possessing a responsible choice.⁴⁹ If life is no more than the chemical interactions, then there is no reason to demand respect in its name. Second, he refutes such a claim for the fact that it does not represent a true understanding of the hierarchy of reality. Even a machine cannot be explained exhaustively in terms of physics and chemistry.⁵⁰ There is a principle foreign to

⁴⁵*Meaning*, 163.

⁴⁶*Meaning*, 163-164.

⁴⁷*The Tacit Dimension*, 41-42.

⁴⁸*Knowing and Being*, 219. 227; *Personal Knowledge*, 336.

⁴⁹See *The Study of Man*, 46.

⁵⁰In *Knowing and Being*, Polanyi admits the comparableness of machines and organism in order to show that the presence of life requires a foreign higher principle to

physics and chemistry operative in a machine.⁵¹

There are indeed aspects in biology which are beyond the scope of physics and chemistry.⁵² It has been noted that the boundary condition is always something beyond the process which it delimits. “Thus the morphology of living things transcends the laws of physics and chemistry.”⁵³ Polanyi explains this position by referring the capacity of organism in dealing with a multi complex situation observed by certain scientists.⁵⁴

In Polanyi’s view, those observations show that life cannot be reduced to mechanical process no matter how complex the process may be.⁵⁵ He insists that physics and chemistry know nothing about conscious efforts and feelings that in many cases accompany the activities of living beings. Indeed, there is a claim that even sentience can be explained in terms of certain

material elements. “In this light the organism is shown to be, like a machine, a system which works according to two different principles: its structure serves as a boundary condition harnessing the physical chemical process by which its organs perform their functions. Thus, this system may be called a system under dual control. Morphogenesis, the process by which the structure of living beings develops, can then be likened to the shaping of a machine which will act as boundary for the laws of inanimate nature. For just as these laws serve the machine, so they serve also the developed organism.” (227); in page 176 he writes: “[...] even if physics and chemistry could be derived from predictions of atomic topography, the existence of the machines could not be stated, let alone accounted for, in these terms. And, accordingly, the knowledge of engineering [...] and of all problems of engineering, as well as of inventions and arguments conducted in terms of engineering, would be absent in a knowledge of the physical and chemical topography of the universe, and, a fortiori, in its atomic topography”. In *Meaning*, 169, he explains: “One thing obvious about mechanisms is that each one of them has acquired its organization by reference to some aim or goal or purpose that is to be achieved by it. That this purpose is not something deducible from the physical and chemical laws that operate its parts can easily be seen by the fact that, although we may be well versed in these laws, we cannot, through the mere physical and chemical study of even simple machines, such as manual tools, tell what the tool is *for*.”

⁵¹*The Tacit Dimension*, 42.

⁵²*Knowing and Being*, 218-219.

⁵³*Knowing and Being*, 227.

⁵⁴*Personal Knowledge*, 336.

⁵⁵See also G. BASTI, *Filosofia dell'uomo*, edizioni Studio Domenicano 1995, 113.

Gianfranco Basti, shows that the natural science helps us to describe life. However such a description does not explain the whole process of life. With the help of the natural science alone, we will never arrive at a scientific definition of life, for life does not belong to physical and mathematical level. “Quella che abbiamo finora tentato descrivendo la vita con l’ausilio delle scienze naturali [...] è dunque una semplice “caratterizzazione scientifica della scientifica della vita” [...] con l’aiuto delle sole scienze naturali, fisico–matematiche, non si potrà mai arrivare ad una “definizione scientifica” della vita perché, la “vita” in quanto termine astratto per in concreto “vivere” [...] non è una nozione di scienza naturale, bensì di metafisica. Con “vita” si intende infatti metafisicamente una delle *perfezioni trascendentali* dell’atto d’essere di una determinata classe di *sostanze*, I viventi appunto, sia in quanto enti fisici che spirituali.”

physico-chemical system so as to produce a conscious machine. However, suppose a machine develops to a conscious thinking, it immediately loses its machine-like character. An automatic operation has no influence on its outcome. Within this perspective, it is too bizarre, Polanyi tends to say, to suppose Shakespeare's writings and plays as the results of an automatic mechanism. Neither can we imagine Hamlet as a result of automatic process.⁵⁶

Polanyi does not dare acknowledge the presence of an active centre operating unspecifiably in all animals which for some can be seen as vitalism. However, he does not mean that science has nothing to say about life. He admits that the organs of the body works like machines involving a series of a hierarchy of mechanical principles.⁵⁷ For that reason, there is no need to overlook the success of biology in explaining living functions. He merely reminds us, as Henry Bergson does, that the success of that kind "must not obscure the fact that these advances only add to the features of life which cannot be represented in terms of laws manifested in the realm of inanimate nature."⁵⁸ Polanyi then feels confident in insisting that physics will never give us the key to life.

Morphogenetic Regulation

There are of course biologists who deny that living function can be represented in terms of engineering and technology. For them the process of life has a totally different characters. They call it organismic process. Polanyi loves to cite their example in his effort to show living function as a higher degree of reality. Such organismic process are found at work in regeneration, and are most strikingly demonstrated by the embryonic regeneration discovered by Hans Driesch.⁵⁹ Embryonic development is led by a spontaneous adaptive reorganisation to achieve its predetermined end even under profoundly modified conditions.

The most amazing process is the capacity of one part of the embryo of certain lower animal of regenerating the whole embryo and at the end a normal individual. Hans Driesch discovered such a capacity in the embryo of sea urchin. He found that throughout several amputations any cell or combination of cell separated from embryo developed successfully into a normal sea urchin. He described this capacity as a harmonious equipotential. Polanyi describes it—as it is known in biology—as morphogenetic regulation.⁶⁰ Such a potential improvisation in resolving problems in order to achieve a fixed end is, for Polanyi, a capacity beyond the explanation of physics and chemistry.

The morphogenetic equipotentiality can be enlarged to the heuristic process of resolving problem or computing a predetermined end. Polanyi shows with

⁵⁶*Personal Knowledge*, 336.

⁵⁷*Personal Knowledge*, 337.

⁵⁸*The Tacit Dimension*, 42.

⁵⁹*The Tacit Dimension*, 42.

⁶⁰*See Personal Knowledge*, 338.

this the presence of a creative centre in living beings which more clearly manifests in the activity of consciousness.⁶¹ He refuses Gestalt claim that perceptual shaping and biological regulation are but the result of physical equilibration.⁶²

It has been said that even the most complex machine cannot produce originality manifested by the lowest living things. Originality is characteristic for living things operating equipotentially in dealing with unexpected and various situation or circumstances. Tacit knowing is seen by Polanyi as the manifestation of the equipotentiality. It integrates particulars hitherto unrelated things into a comprehensive entity for the solution we have in mind. We have to classify to this process the composition of a new poem, the invention of a machine, or the making a scientific discovery. They all need the capacity of reorganising available indeterminate means for achieving a comprehensive feature that we deem to be right.⁶³

The equipotential creativity cannot be shown by machine, hence it cannot be reduced to physico-chemical interactions. Inanimate nature has nothing to say about achievement and about sentience.⁶⁴ Whatever the result may be, one

⁶¹*Personal Knowledge*, 339.

⁶²*The Tacit Dimension*, 43.

⁶³ Polanyi refers to the observation of K.S. Lashley that mutilated rats, which had learned a maze, continue to find their way through it, though the neural paths used in learning had been cut. Admittedly, the manner of their progression was completely different. Nonetheless, each of them manages an errorless run and, at the end, finds the food. Renoir's experience gives a more amazing story. Renoir was a painter before he became crippled with arthritis. After this bad luck he lost the use of his feet and hands. Yet his capacity in painting continued for another twenty years until his death and produced pictures hardly distinguishable from the period when his hands were normal. At that period he continued on painting with a brush fixed to his forearm. Polanyi concludes from this story that "the skill and the vision which he had developed and mastered by the use of his fingers, was no longer in his fingers. It had become a knowledge and purpose of a highly abstract, totally unspecifiable kind: a purpose which could evoke from his mutilated body a set of implementations that were equipotential to his previous performance." (*Personal Knowledge*, 337.)

⁶⁴*The Tacit Dimension*, 44; in *Knowing and Being*, 230, Polanyi argues also against the claim that the identification of DNA, considered to convey the heredity features of living things from generation to generation, gives proves to the reduction of living process to physical and chemical process. He writes: "We conclude that in each embryonic cell there is present the duplicate of a DNA molecule having a linear arrangement of its bases—an arrangement which, being independent of the chemical forces within the DNA molecules, conveys a rich amount of meaningful information. And we see that when this information is shaping the growing embryo, it produces in it boundary conditions which, themselves being independent of the physical chemical forces in which they are rooted, control the mechanism of life in the developed organism." The similar argument is given also in his *Meaning*, 167: "But since we are unable, from the structure of the DNA, to predict their existence chemically, we must admit that we do not yet have the reduction of living process to physical and chemical

thing is clear, namely, there is an insistent effort to achieve its goal. This goal, according to Polanyi, must have value inexplicable in terms of the process having no such value.⁶⁵

Basic Form of Commitment

In the light of Polanyi's idea of knowledge as a process by which we deal with the reality, we then have the largest sense of knowledge as to cover also perception and action. This helps us to understand Polanyi's idea that a kind of commitment is present in living beings especially in *action* and *perception*.⁶⁶

According to Polanyi, it is easy to see the presence of commitment in action and perception. We know that animals eat something in order to satisfy their hungry; they drink to satisfy their thirst. Moreover, in seeing an object our retinas undergo a continuous accommodation according to variable distances. Nonetheless, we see the object in a constant size, for we endorse the affirmations implied in it, namely that the object does in fact remain of constant size. "We have met here some primitive form of commitment, and biology has been revealed as an appreciation of commitment. To swallow something in the hope that it may be wholesome is clearly a commitment, and so is every act of seeing things is one particular way."⁶⁷

The degree of commitments, according to Polanyi, is, of course, relative to the increasing of consciousness performed by the individual being. First, it is shown in a primordial manner of vegetative life, and going on one step higher it operates in a primitive state of perception, and eventually we see a responsible commitment in human being.⁶⁸

The different levels of commitments assign a various possibility of success or going wrong in the striving of individuals to achieve a potential end. "Only living things can make mistakes. Only living things can fail—or succeed."⁶⁹ Hydrochloric acid can never fail to dissolve zinc and platinum, while the striving of a paramecium for living and reproducing may succeed or fail. In the active-perceptive level the risk and the meaningful ends are enriched with the

laws that modern biologists seem to think we can have. [...] We not only have not proved that these adaptive aspects of the DNA's building capacity can be reduced wholly to physical and chemical operations, but we never can do so. In *Personal Knowledge*, 362, Polanyi argues that the correct and mistaken decision are attributed to the presence of a rational centre in the animal.

⁶⁵*The Tacit Dimension*, 44. *Knowing and Being*, 230: "Hence the existence of dual control in machines and living mechanisms represents a discontinuity between machines and living things on the one hand, so that both machines and living mechanisms are irreducible to the laws of physics and chemistry."

⁶⁶Action, by being deliberate, is understood as different from the mere functioning of organs, while perception means the process of getting to know an external object by the impression made by it on our senses. (*See Personal Knowledge*, 361).

⁶⁷*Personal Knowledge*, 363.

⁶⁸*Personal Knowledge*, 363.

⁶⁹*Meaning*, 170.

possibility *to do right* and *to know truly*. At this level the organism is guided by instinct and drives in launching its action to fulfil its need. It can err but it is not determined.⁷⁰ Its aim is to achieve its subjective satisfaction as a potential achievement.

The striving for a potential achievement or potential meaning in human thought has a new aspect.⁷¹ The goal of striving in this level is not limited to the fulfilment of biological and perceptive need, but reaches also the problem and discovery. Mind experiences a tension of a problem and strives to resolve it under the guide of a belief of a potential meaning which one thinks are accessible. More precisely, it strives to comprehend reality that it believes to be comprehensible although it is not yet comprehended. The risk to fail is followed by the promise of success. If it succeeds, it will be satisfied, and if it fails it is disappointing. According to Polanyi the choices are not made at random rather controlled by the pursuit of intention. Neither does it occur in a merely spontaneous way, “but are due to an effort to actualise certain hidden potentialities; and the uncaused action that releases, and so also evokes them, is not a physical event but an imaginative thrust toward such a discovery.”⁷² The choices are taken by relying on particulars as clues to the solution of a problem, that is towards a discovery.

From this fact Polanyi underlines an important distinction of human commitment, that is as a responsible commitment. It is this aspect that plays an important role in human greatness and which guides his calling to the universality of knowing.

The Greatness of Human Being

The presence of human kind in the universe assigns a noteworthy step on the comprehension of the meaningful world. With the rise of man a new horizon of meaning appears and is ready to be explored. The field of the meaning to be appreciated is ever enlarged and deepened, and the way the appreciation takes place is of a new sort. Biological need and perceptive stimuli are no more the limits of his endeavour of struggle, and the relatively spontaneous response to the circumstances is now extended to a more organised and more institutionalised project in order to transmit what has been achieved to the next generation as we can see in science.

Understanding human beings within the context of a many-level world can be helped by understanding the process of evolution. In the last chapter of his *Personal Knowledge*, Polanyi confronts the question of how the hierarchy of levels could come into existence and how it could be understood in the light of

⁷⁰See *Meaning*, 177.

⁷¹Polanyi uses the model of quantum mechanics in understanding the process of discovery in human thought. “The notion of gradient sloping in the direction of the minimization of potential energy, as we have spelled it out above, can also be used as a model for describing the efforts of human thought.” (*Meaning*, 176).

⁷²*Meaning*, 176.

what we know about evolution. The same attention is given in *Meaning*, in *Knowing and Being*, and in *The Tacit Dimension*. He absorbs the theory of evolution, but not in the way Charles Darwin explains it. Indeed, there is a reason why he is eager to revise the idea of evolution. Darwinism, Polanyi tends to say, cannot allow for the idea of a hierarchy of levels of reality, and as a consequence fails to bring light to the right place of human beings in the universe.

Polanyi's Critics on Darwinism

The reaction to the theory of organic evolution proposed by Darwin was of different sort and reason. Those who accept the theory consider it as an important development of science especially in explaining the enigma of living beings. When *On the Origin of Species* was published for the first time on Nov. 24, 1859 all editions were sold out immediately, and by 1872 the work had run through six editions. That means the theory has gained a very large interest. The opposition to this novelty was led mostly by religious based objections. Indeed, the theory of modification of species within the process of evolution has raised a serious question on the biblical narrative about creation; that God has created distinct species of living things. It is even more provocative for those who hold a literal interpretation of the book of Genesis.⁷³

The approach launched by Polanyi to the problem of evolution is of a different sort. He admits some true elements in the theory, but he opposes the very basic assumption of the theory of Darwin about the nature of reality. Darwin's theory of evolution offers a conclusion of one single level of reality, and hence loses sight of reality with which the theory deals.⁷⁴ If the struggle for existence or the natural selection is the only factor that can convincingly justify the varieties of species, then we have to admit that all living beings that continue to survive have the same value. They are all the winners, and there is no other category we can apply to them regarding their position to each other, except that those which are becoming extinct lack the selective advantage.

This, of course, is not the way we deal with reality. In the context of natural

⁷³Fredrick Copleston writes about this: "Unless perhaps we happen to live in one of the few surviving pockets of fundamentalism, it is difficult for us now to appreciate the ferment which was caused in the last century by the hypothesis of organic evolution, particularly in its application to man. For one thing, the idea of evolution is now common coin and is taken for granted by every many people who would be quite unable either to mention or to weigh the evidence adduced in its favour. For another thing, the hypothesis is no longer an occasion for bitter theological controversy. Even those who question the sufficiency of the evidence to prove the evolution of human body from some other species commonly recognize that the first chapters of Genesis were not intended to solve scientific problems, and that the matter is one which has to be settled according to the available empirical evidence." (F. COPLESTON, *A History of Philosophy*, III, New York 1993, 103.)

⁷⁴*The Tacit Dimension*, 46.

selection, man has a bad position today. His survival on earth seems less probable than that of the insects.⁷⁵ Nonetheless, our interest of how insects come into existence has never exceeded the same attitude we have with humankind. Indeed, the history and ethology of insects has never turned our interest from human history, from literature and art. We are concerned with reality in certain ways according to its appropriate level. These facts, however, seem to be ignored in the name of scientific approach. “It is the height of intellectual perversion,” he writes, “to renounce, in the name of scientific objectivity, our position as the highest form of life on earth, and our advent by a process of evolution as the most important problem of evolution.”⁷⁶

We have seen previously how Polanyi shows the operation of new principle in the rise of life regarding the laws of physics and chemistry. Such an involvement of the new principle is, for him, a product of evolution. Polanyi’s idea of life is close to that of Henry Bergson conceiving it as a real whole, as an indivisible continuity that cannot be isolated in mechanism of parts. Evolution must be understood as the rise of an ever higher level of reality irreducible to the lower on which it relies for its operation. We can recognise then a strictly defined progression, rising from the inanimate level to ever higher additional principles of life.⁷⁷

Living beings can be divided in different levels. Polanyi suggests a gradual steps of operation, from plant to human being, each of them leaves a boundary open for the operation of the next higher level.⁷⁸ Accordingly, we see the vegetative functions sustaining life at its lowest level while leaving open the higher functions of growth as well as the operations of muscular actions. On the next level, the laws governing the muscular actions leaves open the integration of such actions to innate patterns of behaviour. These patterns, on the next higher level, are shaped by intelligence leaving open a still higher principles of a responsible choice.

It is difficult, of course, to establish precisely the skip from one level to the next. In some cases we see a very slight difference between living beings of different levels. We admire, for example, the presence of intellectual ability, akin to that of human beings, performed by other animals. Similarly, the development of embryo and the growing of a child show the same variation. Nevertheless, this does not mean that the higher can be reduced to the lower. On

⁷⁵A quite similar position is posed by Alfred Whitehead in his criticism of the theory of Darwin. He argues that if the only aim of living was no more than to maintain life, than the aim is more secure in the non-living beings. Accordingly, it is absurd to suppose the presence of reason in human being only in terms of the surviving. For, if it was so, the aim should have been accomplished in the inorganic nature. A rock may “live” or last for eight thousand million years, in front of which the chance for surviving of any species in this world is absolutely unfortunate. (See E. PAZI, *Il pensiero scientifico contemporaneo*, Firenze 1950, 82).

⁷⁶*The Tacit Dimension*, 47.

⁷⁷*Knowing and Being*, 234.

⁷⁸See *Knowing and Being*, 234; See also *Personal Knowledge*, 387-388.

the contrary, in Polanyi's view, it proves that the higher levels of life are present in earlier stages of evolution. "They may be present in traces long before they become prominent. Evolution may be seen then as a progressive intensification of the higher principles of life."⁷⁹ This aspect has not been taken into consideration within the theory of evolution passionating only the selective advantage of random mutation assisted by the idea of one level of simple element of reality.

In *The Tacit Dimension* Polanyi describes another tendency that leads to the misrepresentation of evolution. Evolution, in his observation, instead of being comprehended in its proper sense, has been replaced by the attention to the origin of species.⁸⁰ In other words, evolution explains only how one species turns into another, but never how living species, and then species with powers of perception, and then human intelligence, arose for the first time.⁸¹ For that reason, he insists, "natural selection is concerned with populations; it plays no part in the evolution of a single human being."⁸² Polanyi adds to the variation of species, as a result of accidental mutation and natural selection, the changing of type achieving new levels of existence, and reveals with it a principle superior to mere adaptation promoted by the natural selection.⁸³

The understanding of evolution offered by Polanyi is a criticism against modern science and the neo-Darwinism embedding metaphysical faith, that is, that science can and must explain all the phenomena of nature in terms of one hypothesis, and that a hypothesis of maximum simplicity, of maximum impersonality and objectivity. According to Marjorie Grene, as cited by Drusilla Scott, Neo-Darwinism is logically simple. "There are just two things happening, chance, variations, and the elimination of the worst ones among them, and both these happenings are just plain facts, things that do or don't happen, yes or no. Nature is like a vast computing machine."⁸⁴ Of course this position is, in Polanyi's view, self-destructive. For if the mind is simply the product of natural selection its conclusions are not reliable. Polanyi, therefore, prefer to lay his idea of evolution on the assumption of a many-level and meaningful world.

⁷⁹*Knowing and Being*, 234.

⁸⁰*The Tacit Dimension*, 47.

⁸¹Richard Allen notes this in his account of Polanyi's position toward Darwinism. See R. ALLEN, *Polanyi. Thinker of Our Time*, London 1990, 67.

⁸²*The Tacit Dimension*, 47.

⁸³*Personal Knowledge*, 385

⁸⁴Drusilla Scott uses this citation in his account in order to show the similarity of view offered by Polanyi and Marjorie Grene regarding the concept of evolution of Darwin inherited by the neo-Darwinism. He writes: "Marjorie Grene and Polanyi both explore the lines in modern biological work that seem to lead to a more open theory than Darwinism, one that could allow for the emergence of higher levels of being only to be understood as real wholes. Such a theory would be part of a philosophy of life, which Darwinism cannot be." (D. SCOTT, *Michael Polanyi*, 125).

The manifestation of human consciousness is a remarkable indication of an innovating principle operating in the process of evolution especially in the rise of human beings.⁸⁵ Again he writes by precizing his argument on the phenomenon of consciousness and the responsibility possessed by the human race. These aspects, he insists, are inexplicable in terms of mechanistic outlook claimed by Darwinism.⁸⁶

Human Destiny

Human being then occupies a special place within the hierarchy of reality. He is, in fact, the most precious fruit of creation. This superior quality manifest in his moral sense and in his free and responsible choice. This quality, however, is accompanied by the risk of failing. The special place of human being manifests also in his universal intent enabling him to transcend his subjective interests. According to Polanyi the products of the creativity of thought can be better understood in the context of the universal intent, through which human being transcends his individuality.

Superiority and Liabilities

The presence of the human race in the grandstand of history has given a distinctive step to the process of evolution as a continuous process. While possessing all the capacities possessed by the lower level, human beings have more. He has more possibilities including the superiority on one side, and the possibility of failing on the other. They are the consequences of the law of a many-level world, that is that the series of increasingly comprehensive operations which lead up to the emergence of man is accompanied at every step by an additional liability to miscarry. A human being, therefore, has these aspects more than his lower companions.⁸⁷

A Human being, within this perspective, is facing a risky existence. His capacity to choose a right direction is accompanied by the possibility to do the opposite. He is free and feels responsible, and at the same time he is able to neglect his responsibility. They are all the possibilities absent in the animal life, let alone at the vegetative level. According to St. Thomas Aquinas the possibility of committing evil is a consequence of the freedom of human being, and that this possibility cannot be eliminated without eliminating a lot of the possibility of benefits.⁸⁸ Aquinas presented this argument to show that the presence of evil in the plurality of gradation of things does not contradict the goodness of Divine Providence. Polanyi asserts that the moral sense possessed by a human being cannot be separated from the possibility to choose another direction.

⁸⁵*Personal Knowledge*, 386-387.

⁸⁶*Personal Knowledge*, 390.

⁸⁷*The Tacit Dimension*, 50

⁸⁸See S. THOMAS, *Summa Contra Gentiles*, Lib. III, Cap. 73, 4.

Indeed, the superiority of the human race in the hierarchy of living beings can be seen in different manifestations. In *The Study of Man*, Polanyi describes this peculiarity and calls human beings, in virtue of them, the *peak of creation*,⁸⁹ and in *Personal Knowledge*, the *most precious fruit of creation*.⁹⁰ Indeed, we experience the greatness of fellow men more than other living beings.⁹¹ Accordingly, the achievement of man's evolution exceeds any other living beings.⁹²

Such a supreme status, which demands our respect, is possessed by the whole humanity in virtue of his moral sense. Even when this moral sense seems to be absent, its mere possibility is sufficient to demand our respect. With the rise of man, Polanyi holds, evolution has arrived at one point where the domination of self-preservation is enriched with and expanded to a moral sense. A pure self-seeking prevailing for five hundred million years is now directed to a higher demands, to a peculiarly human relation to other men, that is to feel reverence for men greater than oneself. Such a capacity to feel the higher obligation, in Polanyi's view, is the manifestation of human greatness. For, as he writes at the end of *The Tacit Dimension*, "if evolution is to include the rise of man, with all his sense of higher obligations, it must include also the rise of human greatness."⁹³

Universal Intent

The destiny of man is, of course, evident in the expansion of personhood possessed by the lower animal to the threshold of true mental life. Polanyi follows the description of Teilhard de Chardin about the ascent of the ultimate evolutionary step, called *noogenesis*, by which human knowledge was born. This step is achieved by a human being by creating for him a meaningful integration of realities such as the formation of a society and the invention of language in virtue of which he is permitted to create a lasting articulate framework of thought. This is the world created by man called by Teilhard de Chardin—and Michael Polanyi agrees with him—the noosphere.⁹⁴ It is the cultural stratum in which a human mind lives on this planet.⁹⁵ Polanyi underlines the important role of this new sphere in giving a mark to the presence of man.⁹⁶

⁸⁹See *The Study of Man*, 43.46

⁹⁰See *Personal Knowledge*, 385.

⁹¹*The Tacit Dimension*, 51.

⁹²*Personal Knowledge*, 385-386.

⁹³*The Tacit Dimension*, 52.

⁹⁴Polanyi applies the terminology 'personhood' to organism equipped with a nervous system enabling it to carry out operations of self-control. (See *Personal Knowledge*, 388)

⁹⁵See *The Study of Man*, 60.

⁹⁶See *Personal Knowledge*, 393.

Every single human being, since his coming into existence, is installed to and achieves a responsible personhood by entering a traditional noosphere. We are then born as members and, at the same time, creators of the noosphere. Our race as a whole achieved such personhood by creating its own noosphere: the only noosphere in the world.

Indeed, the achievement of noosphere is another step toward a meaningful world. It is the second major rebellion against meaningless inanimate being. The first leap has taken place with the rise of living things equipped with self-centred individual, and yet lacking the awareness of the rationality of their performances. There was a long period of struggle and evolution until, at last, a new horizon was opened. Now the self-centred individual was accompanied by the noogenesis creating a new fabric of life not centred on individuals. When life is no more centred on the individual, Polanyi emphasises, then the natural death of the individual is transcended. The function of man's body, in this respect, ceases to be merely an instrument of self-indulgence and becomes a condition of his calling in the framework of a universal intent and eternity.

This dynamism is a momentous emergence that can be comprehended only within the framework of a hierarchy of reality. The rising of human consciousness is the key for its comprehension, for, looking at its activity, we know that it must not be reduced to merely material elements of our body. It is in accordance with the formula that, according to Polanyi, a comprehensive entity cannot be wholly explained in terms of its particulars. Yet the particulars constitute the condition for the entity above it, by leaving a boundary open for the operation of successive higher level. Accordingly, human consciousness, although it arises and dwells in the body—that there is, as Teilhard de Chardin describes, so little separable anatomically from the anthropoids—it, nevertheless, transcends human anatomy.

The transcendence of consciousness to the body is evident in the difference between thoughts and the neural process which for some are merely the question of the using of different languages. Polanyi, however, shows that they are ontologically two different things. “We speak of the thoughts Shakespeare had while writing his plays,” he asserts, “and not of the thoughts of hydrochloric acid dissolving zinc, because men think and acids don't.”⁹⁷ Therefore there is no doubt, following Polanyi's analysis, to accept the human position as the most precious fruit of evolution that cannot be totally elucidated by physics and chemistry. The special position of man in that process can be seen in the fact that the terrestrial life has waiting for a long time until the rise of man that bears thought in the universe.⁹⁸

⁹⁷*Personal Knowledge*, 389-390.

⁹⁸*The Study of Man*, 69-70; See also *Personal Knowledge*, 390.

Recognition of Metaphysical Reality

While the positivists turn their focus on observable data and verifiable statements, Michael Polanyi makes clear the indispensability of metaphysical faith playing an important role in our activity of knowledge. Scientists, in using their statements, cannot exclude themselves from such a basic conviction. Metaphysical reality, being intangible, is often condemned as unreal and regarded to be merely epiphenomenal or illusory. In Polanyi's idea of reality, however, this kind of isolation cannot be accepted. Relying on his idea of the hierarchy of reality, he finds that reality has to be comprehended in different gradations, from the lower to the higher. When the noogenesis started its first flame a new level of reality was ready to come into existence. It eventually presents us with two kinds of reality, namely the realities or integrations forming the noosphere and those existing prior to the noosphere. Both are real, Polanyi holds, and there is not sufficient explanation of claiming the first as less real and the latter as more.

Redefining Reality

In order to understand the meaning of reality according to Michael Polanyi, it will be helpful to bear in mind his idea of the structure of tacit knowing in its correspondence with the structure of its object.⁹⁹ In other words knowing has the same structure with the reality as its object.

The relation between particulars to their comprehensive meaning brings us back to the idea of the emergence which produces an ever higher level of reality by controlling the marginal conditions left indeterminate by the principles governing the lower one. We have seen such an emergence forming different levels starting from inanimate to living things; from biotic level to the rise of human consciousness and the building of the noosphere. In Polanyi's view the rising of a higher level is a manifestation of potential meaning as aspect of reality. They are all real and there is no reason to claim the tangibility as the criteria of reality. The higher levels are less tangible and for that reason tend to be considered as less real and have to be explained in terms of the tangible. This should not be the way we understand reality, Polanyi suggests. Reality must be approved by its potential meaning, that is, that it has some nature of its own into which we may penetrate further. Within this perspective we understand why person and problem have to be considered as more real than a cobblestone.¹⁰⁰ To trust that a thing we know is real is, in this sense, to feel that it has the independence and power for manifesting itself in yet unthought of ways in the future.

Obviously, this is a direct opposition against the modern scientific conviction which holds the tangibility as the main criteria of reality. According to Polanyi, there are realities, and even more real, which are not tangible. Mind

⁹⁹*The Tacit Dimension*, 33-34.

¹⁰⁰*The Tacit Dimension*, 32.

is real. Problem is real; and man's skilful exercise of his body is real entity too. We know them only with an intensive participation by relying on particulars as clues to their focal whole. If we move to a deeper or more comprehensive understanding of human being, we tend to pass from more tangible particulars to increasingly intangible entities: to entities which are more real; more real, that is, in terms of Polanyi's definition of reality, as likely to show up in a wider range of indefinite future of manifestation.¹⁰¹ Science assumes this fact although most of scientists will not acknowledge it for the sake of objectivity. In Polanyi's view, however, it is this conviction that guides scientists to go on to discover further knowledge which is unknown and inconceivable today. Within this perspective, discovery is a manifestation of the hidden aspect of reality guided and prompted by our intimation with them.

This definition embraces much more extensive contents than is held by positivistic view. Consequently Polanyi reminds us to extend our idea of reality to the unidentified territory that is not tangible. This project, Polanyi admits, means the restating an ancient metaphysical notion in new terms guided by gestalt psychology.¹⁰² Polanyi demonstrates that knowledge may include far more than we can tell. This theory corresponds to his idea of reality, and that this idea of knowledge can only be apprehended within this idea of reality.

Metaphysical Reality

Within the new understanding of the reality an acceptance of a metaphysical reality is now possible. If the tangibility is not the criteria of a reality to which our knowledge corresponds, then the basic argument of the positivistic skepticism has to be revised. Reality is more than those we can touch, observe and measure. Accordingly knowledge cannot be confined to things possessing those criteria. Its scope must reach also the metaphysical reality.

In Polanyi's thought metaphysical reality, includes all the targets of our ideal statements, such as truth, justice and morality. They are all realities that cannot be reduced, as done by the current science, to physics and chemistry, and ultimately to forces acting between atomic particles. It is for the sake of this idea that Polanyi writes: "We need a theory of knowledge which shows up the fallacy of positivistic skepticism and supports the possibility of knowledge of entities governed by higher principles."¹⁰³ The metaphysical reality then has to be seen in the framework of the emergence of the higher entity from the lower one that brings us to the rising of a living thing capable of pursuing the universal intent and feeling responsible.

There is no doubt that Polanyi's effort to show the validity of the claim of

¹⁰¹ See *Meaning*, 168; and in *Science, Faith and Society*, 10, Polanyi writes: "Real is that which is expected to reveal itself indeterminately in the future."

¹⁰² "The Unaccountable Element in Science", *Philosophy. The Journal of the Royal Institute of Philosophy*, 37/139 (Jan. 1962) 13.

¹⁰³ *Meaning*, 25.

metaphysical reality, and hence the validity of metaphysical belief, is motivated by his observation of how such a claim effects the idea of human being and our respect for it. Polanyi believes that the refutation of the metaphysical reality in favour of holding the positivistic skepticism has created and is still creating human suffering.¹⁰⁴

There is another defect of discrediting the metaphysical belief. It is hold that the existence of a society, a free society, can be maintained only if the members of the society hold spiritual objectives such as truth, justice, and beauty.¹⁰⁵ The freedom claimed in society is based on a mutual recognition between the members holding the society. Only if the members of the community submit to universal truth can they claim equality and freedom.

Polanyi however does not lay his theory of the metaphysical reality merely on its implication to the humanity and social life. He shows also that denying it means acknowledging it in another way. Many times he asserts that the method of disbelieving of any proposition which cannot be verified will at last destroy the whole base of human knowledge. Ironically, the admiration of this method is triggered by the ambition for a freedom of thought. The result, however, is opposite, for it gains only the destruction of its grounds. "And it would destroy, in fact," Polanyi writes, "belief in truth in the love of truth itself which is the condition of freedom of thought. The method leads to complete metaphysical nihilism and thus denies the basis for any universal significant manifestation of the human mind."¹⁰⁶ For what reason, then, can we claim the freedom of thought if thought is no more than the result of the interaction of atoms?

The acknowledgement of the metaphysical reality is the condition of our claiming of reality even of our striving to deny it. Polanyi is not reluctant to use the classic statement to express his position. "The denial of all spiritual reality is not only false but incapable of consummation. It is logically false to deny the existence of truth since the very statement asserting this is based on the assumption that truth can be established."¹⁰⁷ One may think this expression is only a clever use of eloquence. For Polanyi, however, it is not so. How can we accuse an expression launched against our position as only a clever use of eloquence if we do not believe in the truth of the position we are going to defend? So, belief in metaphysical reality is intrinsic to our claim of knowledge. If we do not accept its presence in an explicit way, we do it implicitly.

Conclusion

There are various tendencies which ambitiously present reality as simple as possible. Their effort is to explain everything within a formula that can be analysed and checked by a formal and explicit procedure. Such is the position of empiricism, materialism, and positivism. They hold that the only things which

¹⁰⁴*Meaning*, 25.

¹⁰⁵*Science, Faith and Society*, 79.

¹⁰⁶*Science, Faith and Society*, 76.

¹⁰⁷*Science, Faith and Society*, 76.

can be accepted as real are those capable of being tested, hence it must be tangible and measurable. According to this position, there is only one level of reality. Within the idea of one-level reality there is no chance to recognise the rising of a higher principle harnessing the lower one which provides the boundary conditions. According to Polanyi, it is the root of all the misunderstanding of reality and man prevailing in our time.

Polanyi, on the contrary, shows a hierarchy of reality. With the idea of a multi-level reality he tries to restore the idea of a meaningful world characterised with different levels of reality. Each level of existence is interesting in itself and consequently can be studied in itself. For him each level is real. A material thing is real, a living being is real, mind is real, and the creation of man is real too. There is no reason to claim the more tangible as more real, for real in Polanyi's idea means something that can manifest itself indeterminately in the future. It is with this idea he defends the existence of metaphysical and spiritual reality which is indispensable for the respect of human dignity.

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