

Purpose and Value in Whitehead's Ontology of Science

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Abstract

A descrição da realidade oferecida pela ciência clássica, alicerçada nos pressupostos e metodologias materialistas não é cabal nem rigorosa. Ao bifurcar a natureza, separando a causa da mente humana do que se apresenta à mente para ser apreendido, a ciência tradicional instala o dualismo. O mundo é representado como um conjunto de corpos materiais e imutáveis que se movem às cegas, sem que a sua acção tenha qualquer propósito e sendo todas as suas relações de tipo espacial. Só a causalidade eficiente é admissível porque os corpos materiais não se definem pela sua duração. A filosofia do organismo oferece uma nova perspectiva da realidade. As entidades estáticas e esvaziadas de propósito são substituídas por entidades dinâmicas que exibem intencionalidade e se caracterizam pela sua duração temporal. A valorização emerge assim como resultado do processo.

Aesthetic or moral values are mostly left out of science. Science ignores judgments of value. It gets its authority and its respectability mainly from excluding value from its field of action. It is concerned solely with facts; and facts do not require moral or aesthetic judgements. This kind of judgements can even jeopardize the reliability of scientific theories. For the methodologies of science aim at objective facts and these tend to be completely free of any subjective interference.

Classical physics, for example, emphasizes the universal laws of nature, which describe what we might call objective facts. Physicists draw a line between objective definitions and subjectivity, i.e. they strongly try to avoid everything that has to do with human perception and values. Their goal is to achieve reality, which is independent of the mind. Also they consider only what is universal and abstracted from the world. The diversity of reality does not interest them and is often discarded as irrelevant and

useless.

The method of science also excludes purpose. It relies on efficient causation, which grounds all scientific explanation. Phenomena are regularly correlated; there is a relation between a cause and its effect. In fact, the cause is considered to already contain the effect; sometimes the effect is the logical consequence of the cause. Classical causality claims that physical phenomena can be represented as a series of instantaneous and simultaneous states. Duration is not taken into account. A rigorous determinism is established. But this kind of determinism excludes a final end; it abides by universal rules, and the phenomena themselves must be described as purposeless.

Conversely, contemporary physics tends to discover new relevant questions, which depict the diversity of reality. It takes duration into account and a new concept of causality allows for a certain indeterminism. Values and purpose seem to crop up whenever the diversity of reality is considered. Biologists, for example, run into some trouble with evolutionary theory when they try to explain away final causation.

Alfred North Whitehead, a twentieth-century mathematician/physicist and philosopher, established a new philosophy of organism, which reintroduces value and purpose back into reality and science. His philosophy rejects materialism and reinvents final causation as it emphasizes temporality.

In *Concept of Nature*, Whitehead focuses on the bifurcation of nature. Bifurcating nature consists of considering two different natures instead of one whole nature: one submitted to causal mechanisms, and another, which includes ourselves as self-determining individuals. The bifurcation of nature is, according to Whitehead, the unfortunate result of confusing “what the mind knows of nature” with “what nature does to the mind”¹. This distinction about what is to be found in nature and what is to be found in the mind is illegitimate and splits reality, which is whole, into two systems of reality. There are not two segments in nature: one that represents nature, as it is perceived, and another one as causing perception. Whitehead does not consider nature to be composed of causal and apparent elements. If science wants to unravel what is objective, i.e. what is causal, from what is subjective, i.e. from what is apparent, then it is slicing reality into two and leaving out an important part of it. “Subjective or apparent reality” includes values and purpose. Human action is not devoid of intentionality; also it is not aimless action. We can decide about our deeds and we can feel the scent of a rose and the warmth of the sun. This kind of subjective experience is as real as pushing up a lever and consequently causing a body to move. However, this is not usually taken into account by scientific methodologies.

1. *Concept of Nature*, p. 27.

In *Function of Reason*, Whitehead draws attention to “the mass of evidence lying outside the physiological method which is simply ignored in the prevalent scientific doctrine. The conduct of human affairs is entirely dominated by our recognition of foresight determining purpose, and purpose issuing in conduct.”² Purpose is a major element in our experience. That is as obvious in economic science as it is in evolutionary theory and even in the study of physiology, in as much as certain functions of the body depend upon the foresight of an end. Whitehead argues for a complementarity between efficient causation and final causation. A satisfactory metaphysics cannot dwell upon a valueless and purposeless reality.

Whitehead's ultimate elements of reality, the actual entities are all self-determining. In *Process and Reality* they are described as “the final real things of which the world is made up.”³ They are “drops of experience, complex and interdependent.”⁴ Actual entities emerge from previous data, which they appropriate. Their emergence is process, i.e. they become as they come into being. Process is self-development in accordance with a subjective aim, which is provided by God. Subjective aims shape actual entities; they are but potential elements, which participate in all existence. Actual entities in process of becoming determine themselves in accordance with their subjective aims. This means they are really enduring entities which are self-creating and self-producing. Whitehead often recurs to Espinoza's expression *causa sui* to describe this process of self-creation which unravels in time and is itself temporal. Subjective aims and the self-creating temporal process of coming into being indicate that value and purpose are indeed essential aspects of all existence. In Whitehead's ontology fact is not parted from value, and potentiality is inherent in actuality.

Whitehead's later works *Adventures of Ideas* and *Modes of Thought* explore the history and development of value and purpose in civilization. The last chapters of *Adventures of Ideas*, “Truth”, “Beauty”, “Truth and Beauty”, “Adventure” and “Peace” leave no doubts about the importance of values in Whitehead's philosophy. *Modes of Thought* focuses on general values and extends them to all forms of existence, i.e. to all actual entities. Whitehead is then concerned with mathematics and logic for he analyses abstraction and emphasizes generalization, which enhances a vaster comprehensiveness. The two final chapters dedicated to Nature, “Nature Lifeless” and “Nature Alive” refer to the classical scientific perspective, which is materialistic and ignores duration, and also to a new perspective of an active nature where causation is founded on a theory of immanence which presupposes an active antecedent world as well as a subjective aim. Whereas classical science only finds “rules of succession” in nature, new scientific perspectives

2. P. 13.

3. P. 18/28.

4. *Ibid.*

find creativity and purpose in that same nature. Science does not deal with the whole of reality. Abstraction as carried out by science is incomplete. On the other hand, Whiteheadian generalization aims at including the whole of reality in order to obtain a coherent system. There is no coherence in a system if we leave out elements of experience. The whole of reality must include science, as well as value and purpose. Whitehead's system aims at a generalization ever vaster in order to approach coherence, which is the whole of reality, where purpose and values are obviously included.

We must remember, when we consider Whitehead's accusation that we bifurcate nature that we are prone to act as if our condition of higher beings kept us apart from the rest of nature. We can perceive nature, and we can modify our environment. Nevertheless, our perception of nature is considered by itself, as if we were looking on nature from a safe distance without mingling with it; but in fact perception too is part of nature. There is a widespread belief that the laws of nature are deterministic, whereas human beings are self-determining. This is highly inconsistent with our materialistic creeds and methodologies. We excuse ourselves from our mechanistic views when it comes to our apprehension of nature. We are not to be included in what we perceive. For we are the perceivers and our minds have come into play.

"This radical inconsistency at the basis of modern thought accounts for much that is half-hearted and wavering in our civilisation. It would be going too far to say that it distracts thought. It enfeebles it, by reason of the inconsistency lurking in the background. After all, the men of the Middle Ages were in pursuit of an excellency of which we have nearly forgotten the existence. They set before themselves the ideal of the attainment of a harmony of the understanding. We are content with superficial orderings from diverse arbitrary starting points. For instance, the enterprises produced by the individualistic energy of the European peoples presuppose physical actions directed to final causes. But the science which is employed in their development is based on a philosophy which asserts that physical causation is supreme, and which disjoins the physical cause from the final end.⁵"

Whitehead has been quoted at length, for this excerpt illustrates the relatedness of the bifurcation of nature to efficient causation as the sole justification for our understanding of reality. Thus, what is usually taken into account is efficient causation; final causes are simply ignored or discarded as useless and misleading. This is one way of bifurcating nature. We set nature apart from our purposes, and we set efficient causation apart from final causes. Our knowledge can start anywhere for there is no pur-

5. *Science and the Modern World*, p. 76.

suit of a vaster generalization, or of a final coherence. However, our deeds are directed towards an aim; and here final causation is undeniable. This is the very reason why we separate nature from mind.

Materialism exempts minds from being truly material; the mind may be considered to coincide wholly with the brain but it also appears as a surveying element of natural phenomena; it does not take part in the observable fact, for it is the observer. Mental apprehension is considered to be distinct from the state of being a natural phenomenon; also, natural phenomena are considered to cause mental apprehension. Once again we bifurcate nature: The process of apprehension requires a subject and an object, each one taken *per se*. However, for Whitehead the term 'subject' is relative to 'object', and vice versa. They relate in such a way that anything in an object provokes the activity of the subject and the subject's activity is special as far as it concerns the object⁶. The object is not a clear-cut, passive entity. There is a factor of activity, which is essential to experience. Experience is whole and emerges with activity; therefore there are no passive objects waiting around in order to be apprehended by a subject. The subject/object distinction is only permissible when viewed in abstraction; otherwise, all we can discern is the activity, i.e. the creativity, underlying the whole of experience. Indeed in contemporary physics, the notion of a completely detached observer is an illusion from a quantum point of view.

"For natural philosophy everything perceived is in nature. [...] Natural philosophy should never ask, what is in the mind and what is in nature. To do so is a confession that it has failed to express relations between things perceptively known, namely to express those natural relations whose expression is natural philosophy."⁷ Thus natural philosophy includes both the perceiver and the perceived. However, when we bifurcate nature, as we usually do, we investigate the cause of perception and consider nature its efficient cause. "The whole notion is partly based on the implicit assumption that the mind can only know that which it has itself produced and retains in some sense within itself, though it requires an exterior reason both as originating and as determining the character of its activity."⁸ We then make a distinction between causal nature and apparent nature, between what causes our perception and what appears to us as nature. In this process of analysis, final causes are never taken into account. They are not relevant to our conception of nature as causing the functioning of the mind, neither are they pertinent to our notion of the mind as producing the perception within itself.

We should not trouble ourselves with the content of the mind, for the mind is no container of perceptions or thoughts. There is this togetherness

6. *Adventures of Ideas*, p. 176-179.

7. *Concept of Nature*, p. 29-30.

8. *Ibid.* p. 32.

in nature, which accounts for perception, for thought, for knowledge; there is no need to separate the perceiver from the perceived; there is no need to separate the effecting cause from the inherent cause. In other words, every being is self-orienting and self-creating in virtue of its subjective aim. There is a final aim inherent in each creature; an actual entity will come into being in accordance with this subjective aim, which is the proper mode of its self-constitution. Thus, the subjective aim is the final cause of the actual entity. On the other hand, every being appropriates its antecedent beings so that it can constitute itself in accordance with its subjective aim. This kind of appropriation is called prehension in Whitehead's philosophy. Antecedent actual entities function as efficient causation for the new actual entity that is in process of coming into being. Therefore, final causation and efficient causation intertwine, and in so doing produce a new actual entity. The togetherness of experience is instantiated by these complex and interdependent unities of being. Actual entities are self-creating; also, they are the result of the would-be actual entity's appropriation of previous actual entities. They are both self-causing and caused by antecedent causes. Togetherness implies efficient causation and final causation, as well as their intermingling. The bifurcation of nature is not consentaneous with the ontological constitution of each being. The self-creation of an actual entity is sheer activity, and both efficient and causal causation are involved in its development. Perception or knowledge cannot be cut into two. The act of perception and the act of knowing are whole and indivisible. The actual occasion embodying the act of perception is not to be divided into perceiver and perceived; the subject of experience, i.e. the perceiver, is also its result, known as the superject, i.e. it is also what is perceived. The subject relates to its object in such a way that the object provokes the activity of the subject and the subject's activity is special because it concerns the object. There are no passive, defined objects lying about, so that they can be perceived. Perception and knowledge are whole and emerge with activity. "Our knowledge of nature is an experience of activity (or passage). The things previously observed are active entities, the 'events.' They are chunks in life of nature."⁹ Purpose is thus included in nature and the recognition of its being there can prevent the bifurcation of nature.

Human conduct is dominated by purpose. However, human conduct is usually left out of any consideration regarding the laws of nature. Science judges the activities of the animal body as being governed by physical and chemical laws, leaving out any other principles. It so happens that in human conduct purpose prevails. If we take into account solely the laws applying to inorganic matter, a considerable part of reality will be ignored. Evidence that purpose is an important and substantial element in nature is so huge that we cannot fail to acknowledge it. If the notion of final causa-

9. *Concept of Nature*, p. 185.

tion is erased from consideration, meaning will be hard to find.

Whitehead writes, as he emphasises final causation: "Again consider the voyage of the battleship *Utah* round the South American continent. Consider first the ship itself. We are asked to believe that the concourse of atoms, of iron, and of nitrogen, and of other sorts of chemical elements, into the form of the ship, of its armour, of its guns, of its engines, of its ammunition, of its stores of food, – that this concourse was purely the outcome of the same physical laws by which the ocean waves aimlessly beat on the coasts of Maine. There could be no more aim in one episode than in the other."¹⁰ Human conduct includes purpose, but physical laws are considered not to apply to human conduct. Purpose is ruled out by science as being outside its scope. In this way, the methodology of science has proved to be a successful one.

But when we consider, for example, the functioning of the animal body or the theory of evolution, purpose is an essential element in understanding reality. Many functions of the animal body depend on the anticipation of an end. For example, digestion is destined to nourish the body and eliminate residual substances. Also, in the theory of evolution living species can only be seen to exhibit the characters inherent in other living species if a final end is taken into account. However, final causation is discarded and seen with mistrust. For it can introduce easy explanations and exclude the hardship of tracking the sequence of antecedents.

Whitehead's defence of final causation does not overrule efficient causation. Final and efficient causation are both needed for the explanation of reality. "A satisfactory cosmology must explain the interweaving of efficient and final causation. [...] But neither sphere should arbitrarily limit the scope of the alternative mode."¹¹ The exclusion of final causation renders efficient causation inexplicable. Vacuous and valueless existence turns concrete reality into an absurd. The very existence of an actual entity is the attainment of an end; it is its self-constitution in accordance with its subjective aim. "This is the doctrine that each actuality is an occasion of experience, the outcome of its purposes."¹² The process of coming into existence is self-determination and self-definition. The actual entity is one, among other actualities. It is not to be identified with any other. It is an individualized entity; its attained unity compares to none other. The inheritance of antecedent data is the outcome of efficient causation; final causation introduces novelty. An actual entity as a self-determining entity, in virtue of its subjective aims, is a new entity. Its way of coming into existence, its way of being *causa sui* creates novelty. "The novelty is introduced conceptually and disturbs the inherited 'responsive' adjustment of subjec-

10. *Function of Reason*, p. 14.

11. *Ibid.* p. 28.

12. *Ibid.* p. 31.

tive forms. It alters the ‘values’ in the artist’s sense of the term.”¹³ The introduction of novelty is the introduction of value. It rejects tautology. Self-determination occurs in accordance with a subjective aim. Final decisions are new elements in the constitution of reality. They are truly creation. This is the reason why they can be referred to as the introduction of value. Therefore, purpose generates value.

Worth is the very foundation of our existence.¹⁴ Our primary experience takes value into account. It is an experience of vagueness but each primary experience is different from every other experience. The feeling of worth comes with the vagueness of first experience and with its differentiation from other value experiences. Primary experience is not an experience of clear perception. But it is a value experience. For the vague feeling of primary experience allows for differentiation and for some kind of individualization. In Whitehead’s words: “Here the notion of worth is not to be construed in a purely eulogistic sense. It is the sense of existence for its own sake, of existence which is its own justification, of existence with its own character.”¹⁵ The coming into being of any actual entity is a realization of worth, no matter whether it is good or bad. Actuality is worth in itself. There is a vague sense of importance that differentiates the actual entity from the whole from which it emerges, and also from every other emerging actual occasion. An actual entity is both its own means of attainment and its own end. In this process of self-development there is a sense of worth that is beyond the actual entity itself, which is manifest in self-attainment.¹⁶

In Whitehead’s philosophy, a prehension is the most concrete element in the nature of an actual entity. We could say that it expresses the emergence of worth. It “reproduces in itself the general characteristics of an actual entity: it is referent to the external world, and in this sense will be said to have a ‘vector character’; it involves emotion, and purpose, and valuation, and causation.”¹⁷ It is also a subordinate element in as far as it is not a complete actual entity. Completeness requires a subjective aim, which is nevertheless present in the whole process of constitution of the actual entity. Therefore, final causation is required for the constitution of the actual entity, which is self-determining. Prehensions are the subordinate reflections of an actual entity; in their embodiment of the world they recur to valuation and are purpose driven. The prehension of the world means appropriating the other actual entities and selecting eternal objects for ingression. The selection of eternal objects involves valuation; the self-determination of an actual entity involves purpose. Thus the subjective form

13. *Process and Reality*, p. 104 [159].

14. *Modes of Thought*, p. 109.

15. *Ibid.*

16. *Process and Reality*, p. 350 [531].

17. *Ibid.* p. 19 [18].

of each actual entity includes purpose and valuation. "The components in the concrescence are thus 'values' contributory to the 'satisfaction.'"¹⁸ This is what we might call the ontological description of valuation and purpose in Whitehead's philosophy.

Nature around us is complex and its complexity provides the material for our interpretation of the world. Common sense is a useful tool for our understanding of the macroscopic world in which we live. We usually conceive the world as being composed of solid, permanent things that can move about in space. Space is represented as an empty container that can be filled with these solid, perennial things. These solid bodies are passive and keep their sameness as they change their positions in space; they are the same objects at each instant. Endurance is not taken into consideration. Nature is conceived in abstraction from duration and change; only nature *at an instant* is taken into consideration. The events in nature are mainly changes of motion. These spatial relations between permanent bodies gave rise to Euclidian geometry, which depicts the world of our very existence. We live in a macroscopic world composed of solid, persistent bodies, which can move about in space. However, their motion in space involves nothing but spatial relationships. "This is the grand doctrine of nature as a self-sufficient, meaningless complex of facts."¹⁹ It embodies the absurd, Cartesian notion of an actual entity that requires "nothing but itself in order to exist", as Whitehead repeats insistently throughout *Process and Reality*. Also, these autonomous bodies have a 'simple location': they are passive pieces of matter localized in a specific region, which they occupy. They remain in a fixed region in space and have no reference to any other region.

Similarly, Newton's laws of motion and of gravitation are also meaningless and without value. In Newton's laws, there is no reason for the solid bodies to be connected by forces. The motions of the bodies are arbitrary; also, arbitrary forces explain them. Motions and forces are simply a complex of detached facts; there is no reason for their concurrence in nature. According to Whitehead, Newton "illustrated a great philosophic truth, that a dead nature can give no reasons. All ultimate reasons are in terms of aim at value. A dead nature aims at nothing. It is the essence of life that it exists for its own sake, as the intrinsic reaping of value."²⁰

Modern science encounters a new paradigm. This new paradigm is process. Process is both efficient and teleological. It is "the transition from attained actuality to actuality in attainment", as well as "the conversion of

18. *Process and Reality*, p. 84-85 [130].

19. *Modes of Thought*, p. 132.

20. *Ibid.* P. 135.

conditions which are merely real into determinate actuality”²¹, i.e. “the process of realizing an individual unity of experience.”²² The notion of ‘organism’ combines with the notion of ‘process’. Actual entities are seen as organisms repeating in microcosm the macrocosmic universe. The universe is also an organism. An organism is “an incompleteness in process of production.”²³ The philosophy of organism succeeds materialism as the founding metaphysical doctrine. Purposeless, vacuous material existence with no temporal endurance is superseded by dynamic, durational entities with final aims, directed towards their own self-constitutions.

Nature is passage, as Whitehead says in *Concept of Nature*.²⁴ “There is no nature apart from transition, and there is no transition apart from temporal duration. This is the reason why the notion of an instant of time, conceived as a primary simple fact, is nonsense.” Every functioning of nature requires every other functioning of nature, one leading into the other. Actual entities are temporal entities. They endure in their own particular ways and in so doing generate the creative advance. One characteristic of life is creative advance; aim is another one. Actual entities, i.e. the subjects of experience are inherent in process, which is the process of their own self-production. The subjective aim is the unifying factor in process. Also, it is the reason of the self-determination of actual entities. Aim is a very important character in life. However, classical science can find no aim in nature. As far as science is concerned, there are no reasons in nature. Its methodology deals only with part of the evidence provided by human experience. Science finds laws of succession and juxtaposition governing aimless bits of matter without temporal duration, which only have spatial relations. The notion of organism reintroduces temporality back into reality and science. Also, organisms influence their environment and are part of that environment. Endurance means attainment and realization. A particular way of enduring characterizes a particular actual entity; actual entities are all diverse from one another; therefore, their way of enduring is their way of being. The consideration of temporality enhances the role of aim in the constitution of actual beings.

Today’s science, namely certain biology, seems to be illuminated by the Whiteheadian notion of organism. For example, in molecular biology, functional roles are ascribed to molecules; molecules are considered to be diverse and consequently play different roles. Their differentiated roles emerge from the intertwining of the molecules themselves. We could say they pursue their own particular aims by way of their own particular modes of being and of enduring, and that they are inseparable from one another,

21. *Process and Reality*, p. 214, [326].

22. *Ibid.* p. 129, [196].

23. *Ibid.* P. 214-215, [327].

24. P. 54.

i.e. from their environment. Their original self-attainment presents itself as an irreducible fact due to their particular way of enduring. Each particular molecule will have its own attainment of value. "The salvation of reality is its obstinate, irreducible, matter-of-fact entities, which are limited to be no other than themselves. Neither science, nor art, nor creative action can tear itself away from obstinate, irreducible, limited facts. The endurance of things has its significance in the self-retention of that which imposes itself as a definite attainment for its own sake. That which endures is limited, obstructive, intolerant, infecting its environment with its own aspects. But it is not self-sufficient. The aspects of all things enter into its very nature. [...] The problem of evolution is the development of enduring harmonies of enduring shapes of value, which merge into higher attainments of things beyond themselves."²⁵ The philosophy of organism enables us to understand the theory of evolution. A theory of evolution is not compatible with true materialism. For the material from which such a theory starts is not susceptible of evolution. According to the materialistic doctrine, evolution is a set of external, spatial relationships between material bodies, which have no duration. Besides, evolution is blind and occurs without purpose. Therefore, there is no explanation for the upward evolutionary trend we can find among living species. The survival of the fittest does not coincide with the best instantiations of life²⁶. "In fact life itself is comparatively deficient in survival value. [...] The problem set by the doctrine of evolution is to explain how complex organisms with such deficient survival power ever evolved."²⁷ The theory of evolution presupposes the progression of more complex organisms from previous, less elaborate organisms. There is an underlying activity that justifies the upward trend and ascribes value to each emerging organism. Organisms are no longer purposeless portions of matter. Evolving entities participate in a developing activity that moves upwards because it aims at better and more complex organic structures. Thus the purpose of evolution can be nothing but the production of value.

To sum up: classical science with its materialistic beliefs and methodologies offers no explanation of reality. It considers two distinct kinds of nature: one that is the cause of human mind, and another that presents itself to the mind in order to be apprehended. The bifurcation of nature gave rise to dualistic interpretations of the world and discarded the unifying activity that underlies the whole of reality. Changeless material bodies move blindly in space; their action is purposeless and all their relations are spatial relationships. Efficient causation reigns, for material bodies do not endure. The philosophy of organism establishes process as a new stance on reality. Static, purposeless entities with different positions in space are

25. *Science and the Modern World*, p. 94.

26. *Function of Reason*, p.4.

27. *Ibid.* p. 4-5.

superseded by dynamic, intentional entities with temporal duration. Value emerges as the outcome of process.

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