

Abstract

Skepticism is the philosophy that we know nothing about the world. This approach to understanding the meaning of knowledge won't suffice to making theoretical representations about the validity of knowledge. The contents of ideas must pave the way to processes that provide foundations of ideas to determine paths for thought and conception to be confirmed. These paths are logically constructed in theories whose structures are based on observation. In order to determine what kinds of structures to use in the development of ideas, science is a method that contains specific principles that explain what logical relations there are between mind and the world. Thus, fallibilism is a way of being that decides how to order the logical relations of observation based on how they work in conditions and makes a step in another direction to say what factors are not reliable for the pursuit of knowledge. Consequently, a theory is the logical representation of reality in terms of its phenomena that are events that occur in the process of time and space. Viewing theory as a dynamic enterprise will suffice for establishing a network of minds that share a common goal to discover the meaning or essence of truth and reality.

Section 1: Explaining Scientific Realism

If science is reduced to a metaphysical system of order, then there are no consequences that result from the subject under investigation because of an appeal to belief. Rather than viewing the mind as a religious agent that is part of a cosmological order given by God, the scientist understands the truths of matter, energy, time, and space to be caused by certain processes that have taken place on a geological scale. Truth is an idea in the mind, but its effects must be conceivable according to an objective framework that does not reduce the foundations of science to ontological assumptions and reconstructions of content that the

community of inquirers have already agreed on must be true. Therefore, an opinion of what the meaning of truth is must first begin by accepting the premises of a certain way of thinking about the dialogue with our contemporaries, and make a difference in order to critique what doesn't work, offer new ways of thinking about things, and exploring problems in new ways if we can.

An essential difference between science and philosophy is that science uses experiments to produce truths that are contingent on certain probability claims about future events, while philosophy is concerned with how ideas are dependent on the existences of individuals. The active participation of historical dialogue in philosophy involves potentially crossing swords with all the people that took part in these past twenty five centuries since it began in Greece. Nonetheless, we are bound to our own time in the way that we can think and aim to say how the purpose of a theory is to develop a constructive alternative to scientific realism.

A theory of time and space requires certain objectives that define the meaning of certainty, order, location, and position. Time contains events that occur in a logical order, while space contains objects that have definite positions in relation to each other. Some examples that refer to temporal and spatial relations are concerning the facts of history, geographical locations, and the general empirical view of how objects stand on a ground. These different relations are observable in the contents of four propositions:

1. The first president of the United States was George Washington.
2. The American Revolution was caused by Great Britain's control over the colonies.
3. Canada is north of the United States and east of Italy.
4. The table stands between the wall and chair.

A theory of time must lay out why the logical assertions made in sentences 1 and 2 are different from the relations in sentences 3 and 4 (van Fraassen, 1970, Basic Issues in the

Philosophy of Time and Space).¹ *Polaris* is north of any point on the earth, which we know from observation. But this is an ‘analogical extension’ of the word, ‘north’, that is to say, a comparison of its meaning to something that resembles it, in this case, the star *Polaris* in relation to the *observer*. How there is knowledge that *Polaris* will always be north of any other thing besides itself is a ‘*betweenness relation*’ that means that there is resemblance of particular aspects, which implies that it doesn’t make sense, at first, to ask if *Polaris* is north of other things such as the sun or of the star, Alpha Centauri. These are restrictions and ambiguities that make it difficult to determine if certain places on the earth are actually on those spatial coordinates.

If we say, “The star is north,” the star is the substance, from which its location must be true, and the *is*, causes the substance to be seen, but it is a confused idea because the predicate, ‘north’, applies to the name *Polaris* and other stars that are in the northern sky. At the same time, north can point to another star, X, with a different name, whose position is not always north of a star other than *Polaris*, Y. Logicians make a proposition true by suggesting that this star, X, is not north of *Polaris*. In other words, if I see a star that is *east of Polaris*, Y, I can compare it to a star that is not *Polaris*, Z, to show that this will not be north of *Polaris*. The order of stars must be evidence for the motions of bodies in space whose existences are purely relational. At the same time, the conception of being actually affects the idea of space because of what is believed to be observed. This will be seen later in a brief counter-example about Copernicus’ heliocentric theory and Galileo’s Geocentric theory. Moreover, there must be something in the subject that is actual or potential because all predicates have degrees of determinability. Thus, we cannot say that, “North has the common characters of all things”

¹ Time must have simultaneous, before, and between relations. Van Fraassen does not think that spatial relations such as *north of* and *east of* are basic to subjects because they only concern entities on the earth and are subject to arbitrariness and ambiguity.

since it will represent a star other than *Polaris* when we compare it to that star.² Therefore, Leibniz attributes substance with God, explaining that he must give order to the world and everything conforms to his will. The activities of the soul do not compare with God's plans and intentions, so the properties of the world should not be confused with the processes that understand nature. In the fourth sentence, these restrictions merely suggest that a theory of space must give an account of the betweenness relation because our interpretations will be different according to our intentions. Thus, intention is loosely justified in terms of God and individual action since neither shares a relation to anything but the nature of itself and it does not contain a self-property such as logical knowledge that is consistent with objections. This means that theories are intended to share rules that justify why it is necessary to accept those truths that our beliefs won't admit are true unless we observe them to have effects that work.

If it is possible to know why we do something without justifying its personal reasons, then theoretical order follows from evidence of the relations of time with space. For example, I can reflect on the progress of science, and order famous scientists from first to third and say that Darwin is first, Dawkins is second, and Sapolsky is third.³ These names could have been replaced with other scientists only if there are valid logical reasons that define the meaning of order. Contrary the modern space-time view of physics, Van Fraassen explains that temporal relations cause a temporal order, while spatial relations cause a spatial order. He thinks that spatial relations are much more complex. If between is a 'basic relation' that applies to both time and space, then it is clear that the temporal betweenness causes a simpler order than the

² Substance and being are the beginning and end of all conception. Substance cannot apply to a predicate, while being doesn't connect to a subject. The reasons why this is true remain unclear but in general, thought relates to the contents of the mind while belief is caused by the effects of experience.

³ The relation is 'higher than' can also have been stated by saying, "I rank no one higher than Darwin, only Darwin higher than Dawkins, and only Darwin and Dawkins higher than Sapolsky."

spatial betweenness relation.⁴ Space is three-dimensional, but time is only one-dimensional, although the meaning of dimension is related to the complexity of the order.

Section 2: The Benefits of Empiricism

Karl Popper asks, "When should a theory be ranked as scientific? "Is there a criterion for the scientific character or status of a theory?" (Conjectures and Refutations: The Growth of Scientific Knowledge). These questions center on the principle of falsifiability to define the inherent testability of any scientific hypothesis. If a theory is proven false, some other evolves and replaces it by explaining the new observation. Hence, a code of science is that any hypothesis and experiment are inherently falsifiable and disprovable. No theory is entirely correct, but it cannot be true unless it can be proven otherwise. According to van Fraassen (The Scientific Image, 1980, 1. Introduction), there is opposition between the empiricists and realists because of differences of opinions concerning how the phenomena of nature exist. The realists think that such phenomena necessarily have a cause or explanation which can be found in the causal properties of substances that have natural processes. The nominalists, on the other hand, reject the existence of these properties. The nominalists, who denied the reality of these properties, were in the position of having to reject such requests for explanation. For the development of modern science, philosophers did not focus on the causal properties, forms, or qualities. Boyle explains that his existence depends on the proceedings of experiments that generate qualities that are not comprehensible forms, but he knows are produced mechanically by corporeal agents that have motion, size, figure, and contrivance of their own parts, which are attributes, or the mechanical affections of matter. Van Fraassen also suggests that an atomic theory of matter reconciles the idea that nature contains regularity. If there are theoretical entities such as x, y, or z, they must not be reduced to further parts.

⁴ If x, y, and z are in time, but are not simultaneous, then one of the three is between the other two. However, if x, y, and z are in space, but not in the same place, then one of them is between the other two.

A general disposition of an empiricist is to agree with Aristotle's position that there are powers, properties, and dispositions in the world (Molière's *virtus dormitiva*), which is a subject for epistemologists because it points directly to the causal connections. The atomic hypothesis is not true or false according to the actions of the phenomena, but instead from the series of observations that suppose there is a certain world behind the phenomena. This is the origin of Ernst Mach's phenomenalism in the nineteenth century and the logical empiricism of Hans Reichenbach coupled with the logical positivism of Rudolph Carnap in a radical turn to empiricism in the twentieth century. In philosophy of science, there are foundational ideas about the content and structure of theories, and also how theories relate to the world and users of the theory.

Section 3: The Epistemic Value of Pragmatic Induction

While Hume's problem of induction threatens the possibility of empirical knowledge, there are ways around it that aim to prove that there are certain justified claims to knowledge (Frederick, Falsificationism and the Pragmatic Problem of Induction). Popper chooses not to acknowledge this and explains that there is knowledge without justification. But, if theories are not justified by certain kinds of ideas, then there is no foundation for rational action.⁵ In order to validate the fact that knowledge is created from the efforts of empiricism, it is necessary to distinguish objects of the senses with their immediate impressions and what future possibilities hold in terms of their representations. According to Hume, there is no inferential capacity of individual observations, and all that we know about what we see is contained in the present. This is a problem for philosophers because it causes gaps between deductive truths from observations. We would rather know that something such as x, y, or z

⁵ This is the pragmatic problem of induction. Frederick's main idea is that Popper's solution to the pragmatic problem of induction is inconsistent with his solution to the problem of induction because he solves both in the same negative way. He solves the former by explaining that Popper's epistemology has to do with these reasons. This is in contradistinction to van Fraassen, who argues in "The False Hopes of Epistemology," that knowledge is justified through an inductive process that connects observation with self-correction.

contains properties that will be in accordance with the order of time. That is to say, if there is a property relation of some color to shape, such as black to raven, then on scientific grounds, it would be a valid hypothesis to say that “All ravens are black.” However, based on Hume, it does not follow that this will be the case, in reality, or based on probability, because of what we have not observed. Thus, the point of theory is to classify specific sets of properties that show the relation between observation and belief since this can determine if representations have a certain kind of ‘nature.’ Consequently, the justification of a theory is considered to be ‘plausible’ or ‘subjectively probable’ due to certain experiences and dispositions. Still, there are no grounds for linking these two concepts with truth and objective probability (Hume, 1888, IV, Section 2, 218, III, 1975, IV, II, 32-39, Section 5, I, 40-47, Section 6, 86-94, Section 7, 139)].

The alternative approach to saying how ideas are justified is by an appeal to ‘a priori’ claims, which was proposed by Immanuel Kant. Philosophers such as Bertrand Russell have said that there are latent inconsistencies (1959, 58) because of self-contradictory propositions that were once thought to be self-evident (Frege’s fifth axiom for arithmetic). In general, the incompleteness of mathematical theorems such as Gödel’s second one assumes arithmetic is the reliable operation of consistency. In other arguments, philosophers justify ideas by saying there is other evidence that supports their claims or that they are known *prima facie*.⁶ In any case, there is still the potential for theories to be false. In 1972, Popper developed a new idea that was indifferent to the general theoretical validity of justification. Since we can make our conjectures by using opposing statements of testability, then we can describe the contents of observation in the present. These ‘statements of observation’ are neutral modes of contention (Frederick, 2016, 641).

⁶ This means a false conclusion and no solution to Hume’s problem in terms of the objectivity of probability.

Thus, contradictions of observations are the foundations for theoretical rejections. If there is a principle that cannot be contradicted, then it can be retained for future testing. The essence of theory, then, would appear to be some sort of conjecture that can either be true or false and contains potential to be changed according to new theories and existing ideas. This approach is based on Ockham's Razor, the scientific rule that states the simplest explanation is the one most worth noting and applying to the development of empirical predictions. If we think that the purpose of epistemology is to use arbitrary ideas for the validity of theories, it may not be effective in the development of empiricism. Therefore, the relations that make our theories testable are those that falsify them or say why they are true according to probability. If particular theoretical representations are generated from making observations of reality and phenomena, then it is less likely there will be contradictions because of a consistency of our ideas. This is the foundation for Popper's thesis that falsifiable predictions must endure the tests of science, and if we choose to make revisions, it is for the progress of empiricism.

The next step in making a scientific theory is to accept the truths of observation and the statements produced from them even if they contain theoretical truths that are proven to be false. This is because those refutations are considered to be true. Thus, the relationship between true observation statements and false falsified theories is uncertain. Furthermore, there can be theoretical frameworks that stop us from believing in a new theory or a change in theory. This is done by not using 'ad hoc' or 'conventional strategies' that save a theory from falsification without solving any additional problem (Popper, 1972). Should we reject all accepted theories and claim that our observations are false? This is not reasonable and only appeals to traditional epistemological justifications. It is not known if theories are true or false, but it is possible to recognize epistemic progress, which means there are explanatory features of theories that abide by Ockham's Razor.

Section 3: A New Approach to Epistemology

Hume's problem of induction states that impressions are not reliable when we predict their contents or states in future events. Since observation determines the validity of truths, then there is no certain epistemological method to determine what ideas mean unless it is through inference. The way of the a priori is intimately connected to the beliefs about experience, while the naturalist and also the scientific realist approach explain how the mind is connected to the objects of thought. Nonetheless, neither method is sufficient to point to one paradigm that justifies why certain ideas exist as conceptions to one thing and as relations to things that they are not. If there are genuine scientific concepts, they must be devoid of errors, and complete the picture of history (Reichenbach).

In "The False Hopes of Traditional Epistemology", van Fraassen attributes justified empirical knowledge with the controversy between empiricism and rationalism.⁷ This means that the processes which demonstrate what we call 'true' must have evidence beyond what we say about ideas being true. Hence, rationalism is no longer valid, and there is no purpose in asking the question if true empirical knowledge is possible. If there are numerical truths and logical principles that can extend into empirical methods, then they must be ampliative rules. These are rules of inference that state there is a change or an update of opinion, which do not involve logical assimilation of the evidence. They cannot be demonstrated a priori or derived from induction since this process already contains ampliative rules we accept and are subject to circular reasoning (van Fraassen, *The False Hopes of Traditional Epistemology*, 1.1, *Death by Dilemma: The Disaster of "Classical Empiricism"*). Therefore, induction is not a reliable method for the acquisition of scientific knowledge.

⁷ This question aims to answer if there is true empirical knowledge that must be related to a priori principles. The empiricists reject this presupposition question and answer because a priori gives no essential reasons to justify the contingencies of facts.

A justified account of empiricism must distinguish empirical knowledge from rational or mathematical knowledge. Hume's philosophy offered a solution to the rationalist way of thinking about the world with an alternative skepticism. Reichenbach predicted that classical empiricism and rationalism shared a criterion of adequacy, which explained that absolutely reliable knowledge is possible. In order to escape from the restrictions of this epistemological view, it is necessary to be rejected. The problem is that science follows an inductive method to arrive at conclusions that do not prove why ampliative rules are true. Thus, self-correction, or fallibilism, is the method that will determine what truths there are in the long run. Larry Laudan (1981) called this the Self-Corrective Thesis, which was also used by Peirce. Peirce's opinion is that science must operate with a systematic approach that uses self-correction to arrive at truths (Vol. 2, p. 775). These methods are crude induction, qualitative induction, and quantitative induction. The first makes universal generalizations on positive instances, while the second is the hypothetico-deductive method, and the third is statistical inference based on sampling procedures. Van Fraassen does not think that these are self-corrective methods. For Peirce, the most common ampliative practice is qualitative induction because it uses a kind of testing called abduction, which means explaining inference based on what we conclude after the experiment. Understanding what takes place between cause and effect relationships has to do with our hypotheses, which change and lead to new deductions. If this method can prove a fact prior to an explanation, then it works because we do not have to accept new conclusions and prove why existing hypotheses must be replaced.

In the long run, it seems that Peirce thought that it would be possible for our ideas to work together to generate a Grand Unifying Theory about the universe. Thus, we must look for different hypotheses and new explanations. This means that there must be concrete ways to justify conclusions in theories that present general claims but cannot prove how there are insufficient refutations to counterexamples. Copernicus' heliocentric theory is an example of

the fact that the sun is at the center of the solar system, and the position of the sun in space is evidence for this. It is also clear the earth and the other seven planets rotate around the sun. Thus, the proposition, “All scientific theories only explain the relations of real things” is true until there is a concrete example of a theory that does not contain observable events. Hence, the counterexample, “Some pragmatic truths are motivated by beliefs” supports the fact that the earth was believed to be at the center of the solar system. In these two examples, there are truth-reliable premises with no conclusion that states which sentence is truer unless we relate it to the context of time and in relation to the other, Geocentric Theory. Therefore, theory has contingency that is self-contained in its validity, which is why knowledge is divided into belief and opinion and explained by general and categorical rules.

Section 4: How to Make Metaphysical Ideas Empirically Theoretical

Thus, scientific theories require testable paradigms that validate hypotheses from experimental grounds that contain logical configurations that aim to prove the synchronicity of events. Based on what we learn from cause and effect, we can predict how and why future events will be observable in the conditions of experience. Consequently, time is a necessary condition of experimental procedure because there is no such thing as a scientific truth that only has to do with words. That is to say, truths are dependent on the actions of variables and how they connect to the inferences made during the testing. This contingency of idea and the existence of time makes space a necessary condition of existence. Nonetheless, philosophers have spoken about an absolute conception of time that relates to God and the order of his world according to the laws of the human mind. Since Einstein’s theory of special relativity, there is no doubt concerning the meaning of time as being relative, and that objects move at a relative speed in space according to the position of the observer in relation to the motion of an object. Hence, the laws of motion were no longer independent from the essence of time because time necessarily existed from motion. Stephen Hawking explained there are three

things that build the universe: matter, energy, and space. These things are the foundations of reality and will be essential in understanding how connections can be made to the structure of time. Since time is a numerical entity, there must be some kind of complexity that cannot be described according to logic. If there was, then there would be a Grand Unifying Theorem consolidating all the laws of the universe into one mathematical expression. Therefore, a theory is the collection of opinions that include both past and present ideas which have not yet been solved in terms of their future possibilities.

Hitherto, it is clear that all of what we know about the meaning of substance has to do with science insofar as there is a system of logic that cannot explicate the meaning of time and space unless there are philosophical concepts that provide room for alternative contexts. This is one of the many foundations of complexity in human life because there are no ways that we can reduce things such as the composition of the body to simple ideas of sense. Instead, they are 'irreducibly complex' (Dawkins, Blind Watchmaker) and evolve over such a long span of time so that their functions either work or don't. "Either the eye sees it, or it doesn't. Either the wing flies or it doesn't." The creationists are right that, if genuinely irreducible complexity could be properly demonstrated, it would wreck Darwin's theory. There are assumed to be no useful intermediates. But this is simply wrong. Such intermediates abound in practice which is exactly what we should expect in theory. The combination lock of life is a 'getting warmer, getting cooler, getting warmer' Hunt the Slipper device. Darwin himself said as much: 'If it could be demonstrated that any complex organ existed which could not possibly have been formed by numerous, successive, slight modifications, my theory would absolutely break down. But I can find no such case. Can we find irreducible complexity and wreck Darwin's theory? Would it wreck intelligent design theory? God would have to be very very complex and presumably irreducibly so! (Dawkins,

"IC", *The God Delusion*, 148-151). If the body contains organs which are complex and can't be explained precisely suggests the possibility that mind is a substance.

Section 5: Useful Intermediate Conceptions between God and Science

In "On a New List of Categories" (Peirce, 1868), explains that 'order' is a categorical term relating to 'substance' and 'unity.' The "unity to which the understanding reduces impressions is the unity of a proposition.⁸ Thus, 'being', as a conception, plainly has no content. Concepts have functions reducing the combinations of sense impressions to unity, so that the validity of conceptions implies that consciousness must introduce the concept. The universal conception that we have which comes nearest to sense is *the present, in general*. This is a temporal and spatial awareness that provides the foundation for logical synchronicities, or resemblances of *coordinates*. The denotative power of the mind is what validates the subject of the coordinates. Thus, in the act of attention, the mind directs its power to an object, which is different from thinking any predicate of that object. What is present in general is the general recognition of what is contained in attention. However, since there is no connotation, this means that there is no proper unity. This 'it' is the meaning of substance. Moreover, there must be consideration of the ways that we apply numbers to certain relationships in order to account for the ambiguity of the meaning of the word, substance.

Leibniz (1648, *Discourse on Metaphysics and The Monadology*) inquires into what it is to be an attribute in reality of a certain subject. He thinks that such attributes have to do with the nature of things, explaining that the essence of a thing, *in-esse*, exists because it is virtually contained in it, namely the predicate is in the subject. This remains true even if the proposition is not identical (III, In order to distinguish between the activities of God and the

⁸ This is the connection of the predicate with the subject. The copula as the conception of being means 'actually is' or 'would be' as in the propositions "There is no griffin" or "A griffin is a winged quadruped."

activities of created things we must explain the conception of individual substance, 61). This means that the content of a subject must include the predicate according to the understanding, which unites the concept of the subject with the predicates that apply to it. As a result, there is a temporal justification of the concept because deduction determines ‘the predicates of which the substance is or may become the subject.’ Leibniz’ view of how substance is related to a subject is different from van Fraassen because he thinks that abstraction is what changes the logical relation to constitute a person. A quality such as scientist belongs to Darwin, but it is not sufficiently determined to constitute an individual and does not contain the other qualities of the same subject, nor everything which the idea of this scientist includes.⁹

Time creates consciousness and separates space so that the betweenness relation is not known unless there is some certain relation of mind to a second thing. This occurs through an act of disassociation, that is, a way of understanding how there are patterns of consciousness that have certain causes of unity. The result is knowledge of a substance that is justified by the abstraction of conceptions that illustrate the ambiguity of relations. Spatial variables are objects, while temporal variables are statistical representations. Since time and space are united through observable orders, there is a conscious unity of our knowledge of substance with the betweenness relation.

⁹ If there are substances that exist, then they are connected by a causal principle that connects life and other living things. Carl Jung disagrees with this point of view by saying that there is an a causal principle that connects the two (Jung, Synchronicity, par. 849f, 25).

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