

Science and Metaphysics

The conflict between science and metaphysics may best be expressed by the twentieth century philosophy known as positivism. The Positivists believe in an empirical (sensory) reality that can be discovered scientifically, in which the observer can be completely objective and the observer's life histories, experiences, viewpoints, and interpretations do not influence the choice of methodology, data analysis, and strategy of theoretical development. Truths can be discovered in the lab that are timeless and eternal (universal) and are valid no matter what the particular context. What is important to note is the Positivist rejection of a transcendent reality (or God) of any kind, thus, positivists play the role of debunker of pseudo-science and spiritual myths.

The positivists propose the verifiability criterion of meaning. According to this, a statement is meaningful only if there is the possibility that it can be verified through empirical evidence (evidence derived solely from the senses). Valid statements are expressed with the rules of formal logic. Symbolic logic (as used by logical positivists) reduces logical statements to symbols, in which propositions are absolutely true or false. In addition, logical arguments are valid or invalid. The validity of a logical argument does not guarantee that it is true, only formally correct. The logical positivists believed all of reality could be expressed in the form of logical statements, until challenged by Russell's paradox and Gödel's proof.

Yet, it is this very formal logic, or meta-mathematics, that ultimately calls into question the positivist anti-metaphysical claims: are not such symbolic systems abstractions of the most rarified form and as transcendent as the blessed *Welt Geist* of Hegelian Idealism? Do we find Arabic numerals floating in space; and do symbolic formulas grow on trees? Positivism, and in particular logical positivism, is fundamentally dependent on thoroughly abstract structures of the mind; a mind that Immanuel Kant himself could not rescue from metaphysical speculations.

Positivist psychologists include the behaviorists (Watson, Skinner) and structuralists (Wundt & Titchner). The most well know positivist philosophers were those of the Vienna Circle (Russell, Wittgenstein, Carnap, G.E. Moore). Such positivists took an atomistic and diachronic (historical) approach to science that favored an anti-metaphysical rhetoric. Such rhetoric claimed reality was composed of discrete units, in which the parts were more real than the whole. The holistic and synchronic (ahistorical) view that reality was composed not of “things” but relationships, and in which the parts are real only in relation to each other and the whole was one that the positivists rejected; this more metaphysically favorable approach emerged later with systems theory and process philosophy. The bridge between such disparate views of science may be found in Karl Popper and Thomas Kuhn.

“Our belief in any particular (scientific) law cannot have a safer basis than our unsuccessful critical attempts to refute it” (Karl Popper, 1977, p.112). Sir Karl Raimund Popper (1902-1994) was an Austrian-born British philosopher of science, known for his theory of scientific method and his criticism of historical determinism. He was born in Vienna and received a Ph.D. degree from Vienna University in 1928. Although not a member of the so-called Vienna circle, Popper was sympathetic with their scientific attitude, but critical of certain of their beliefs. It was the positivists’ anti-metaphysical beliefs that Popper critiqued in particular.

Popper’s metaphysical critique of positivism began with the critique of inductivism. Familiar with John Stuart Mill, whose principle of uniformity of nature was an alternative to Hume’s claim that contiguity leads to habitual views of cause and effect; and the resulting claim that the future may not resemble past, Popper criticized the positivists for a “uniformitarianist” use of induction, in which particulars were mistaken for universals and vice versa; Positivist pseudo-universals are really multi-particulars according to Popper.

Popper's critique of inductivism concludes with Falsificationism: unlike the verificationist criteria of meaning, falsificationism seeks to disprove hypotheses and delimit knowledge, not discover it. As such, a dichotomy formed between Popper and the Positivists: strict falsification vs. weak verification. Popper adhered to the principle of demarcation and a fallibilist approach to science, in which the psychology of creativity was acceptable. Thus Popper's views are ultimately more radical and more metaphysical than the positivists.

In addition to Popper, Thomas Kuhn was also an influential philosopher of science who was critical of the anti-metaphysics of positivism. As Kuhn states it, "we may...have to relinquish the notion...that changes of paradigm carry scientists closer and closer to the truth." Such a statement is blasphemy to any positivist zealot and calls into question the very goal that positivists claimed science was there to pursue. Kuhn argued that science could be understood with the notion of the Paradigm (belief system). A Paradigm shift is crisis between paradigms that occurs when previous theoretical constructs are no longer able to withstand the competition of newer, more viable theories. Thus, an evolutionary model of science is maintained, in which the "fittest" paradigm survives. As such, science is an instrument for solving problems, not for discovering truth. Thomas Kuhn's Paradigm theory of science is definitively stated in *The Structure of Scientific Revolutions (1962)*.

On closer inspection, Kuhn's paradigm theory has problem of its own: for one, the "absoluteness" of the history/sociology/psychology of science: no paradigm is necessary here, thus Kuhn excludes his own "meta-historical" insight from his theoretical findings. In addition, it appears that some revolutions are more revolutionary than others; for example, Einstein's relativity theory vs. quantum physics vs. Maxwell's thermodynamics. Also, there appear to be subrevolutions in science as well, for example McClintock's molecular biology. How "sub" can

you get & still have a revolution? Kuhn does not answer. And, are scientific revolutions irreversible: many examples suggest otherwise: Newtonian & Leibnizian calculus, A.A. Robinson's non-standard Analysis, Lamarckianism and the inheritance of acquired characteristics, and Joshua Letterberg's later rejection of Lamarckianism. All this suggests a logic of counter-factuals (or what ifs) that Kuhn's Paradigm theory seems ill equipped to address. And finally, where do new "ideas" come from? Is it not "an irrational intuition"; can computer investigation tell us? Kuhn's probable guesses seem closer to the metaphysical web spinning of the German idealists than to any post-positivist theory of science.

Perhaps more than Popper and Kuhn, it is Heisenberg's principle that most damaged the absolutist anti-metaphysics of positivism: the exact position and exact velocity of a particle cannot be determined simultaneously. (x = position, p = velocity, h = magnitude); in addition, an exact determination of energy and time cannot be determined simultaneously for a particle. What this suggests is that we live in an indeterminate universe and that there is an "observer effect" that disturbs any system under study...and absolute objectivity like that espoused by positivism is a myth.

The many problems of positivism *and* falsificationism are the result of an "epistemological mount Parnassus"; a fallacious Cartesian modern philosophical and metaphysical standpoint according to Alfred North Whitehead; Whitehead suggests a mini-paradigm shift that leads us away from Cartesian duality toward a Platonic metaphysics; a new theory of perception that offers a way out of Cartesian subjectivity. Whitehead dubbed this Process philosophy, whose historical roots reach back to Heraclitus the Poet, Anaxagoras the Chemist, and coalesces with the German Idealists, Goethe, Schelling, Emerson, Dewey.

Whitehead was born on Isle of Fanet, later moved to England, and ended up in Cambridge. He began as a mathematician interested in physics at Cambridge. In 1925 he finally left Cambridge for Harvard. *Science and Modern World* (1925) is his first statement of his metaphysics; *Process and Reality* (1928) is considered the Whiteheadian Bible that includes his most mature (and technical) writing on his scientifically based metaphysical views. Whitehead considered reality to be God, or eternal objects in a perpetual stated of becoming (or transformation). Thus Plato's *Timeus* can be recognized in Whitehead's metaphysical philosophy as well as relativity and quantum physics. The combination forms a "process philosophy" uniquely his own. In addition, Whitehead claims atoms are organisms and nothing is inorganic: everything is alive (animism).

Whitehead understood relativity physics as interrelational; this he contrasted with Newton's universe, which was made up of external relationships: those in which the relations do not affect the character of the terms. In contrast, relativity physics is made up of internal relationships, and relations do affect the character of the terms (changed by relations). Whitehead also included the space-time continuum and entities given by quantum physics; each entity views the universe from its own perspective. This mirrors Bergson's doctrine of relations to a certain degree.

Each Whiteheadian being is a collection of acts; a series of pulses. The universe of events is made up of prehension; concrecence; and superjects: toprehend is to be aware, concrecence is the coming together of many attributes into one object, an object becomes a superject when it transcend their own boundaries. This ternary progression is similar to James' view that we are always making ourselves. And like Plato, Whitehead assumes a world that is intelligible and valuable from bottom to top. But, Whitehead's metaphysics inverts Platonism: eternal forms are

a potential, a possibility for Whitehead; eternal objects are potentialities that participate in the world.

It is worth noting that Whitehead's metaphysics is rather pantheistic: God (or nature) struggles toward the best for the best, but always remains imperfect (finite), thus God is in process that affirms a scale of values which include reflectivity, creativity, intelligence, and sensitivity. Whitehead's God is also similar to the quantum: a qualitative pulsation progressing toward greater temporal span and awareness.

Whitehead's analysis and critique of Newtonian physics leads to relativity and quantum physics. What does the results of relativity and quantum physics suggest? Whitehead's answer is a world that is alive and has value. Newton's world is one in which mass particles are inert, they do not act or transmit motion. For Whitehead, there is no homogeneity in nature, which is the opposite of Newtonian physics.

Whitehead's metaphysics integrates a categorical scheme which brings to bear quantum and relativity physics, resulting in a purpose filled universe vectored toward the future. Apparently, Whitehead's metaphysics turns out to be nothing more or less than nature, a nature best understood by two principles:

1. Everything in nature has some degree of value
2. Everything in nature is interrelated to its environment

References

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