The Need for Empirically-Led Synthetic Philosophy

Spencer Scoular[1]

Abstract. The problem of unifying knowledge represents the frontier between science and philosophy. Science approaches the problem analytically bottom-up whereas, prior to the end of the nineteenth century, philosophy approached the problem synthetically top-down. In the late nineteenth century, the approach of speculative metaphysics was rejected outright by science. Unfortunately, in the rush for science to break with speculative metaphysics, synthetic or top-down philosophy as a whole was rejected. This meant not only the rejection of speculative metaphysics, but also the implicit rejection of empirically-led synthetic philosophy and the philosophy of nature. Since a change in *the* paradigm of science requires a change in the philosophy of nature underpinning science, the rejection of the philosophy of nature closes science to the possibility of a paradigm change. Given the foundational problems faced by science, there is a need for empirically-led synthetic philosophy in order to discover a new empirically-based philosophy of nature. Such a philosophy of nature may open science to the possibility of a paradigm change.

 Email: spencer.scoular@vodafone.co.nz.

1. Introduction. The history of the problem of unifying knowledge is closely tied to the relationship between science and philosophy. Traditionally, the philosophy of nature provided the link between science and philosophy. For example, the animistic worldview or belief in spiritual beings was the philosophical position that underpinned Aristotelian science, and the mechanistic worldview or belief that all natural phenomena can be explained by physical causes was the philosophical position that underpinned Newtonian science. However, over the last century the philosophy of nature has been abandoned; there is no longer a unified worldview. As a result, the problem of unifying knowledge is now owned by science, with little input from philosophy. To understand why and how this occurred requires a historical review of the relationship between science and philosophy over the last two hundred years.

2. The Downfall of Speculative Metaphysics. Prior to the nineteenth century, there had been two approaches to unifying knowledge:

1. Top-down rationalism using *a priori* principles (i.e. speculative metaphysics); and
2. Bottom-up empiricism using *a posteriori* facts (i.e. analytical science).

William James (1907, 491) defined the outlook of people belonging to the two approaches as tender-minded (metaphysicians) and tough-minded (scientists) with the outlooks shown in Table A.

Table A

Rationalism versus Empiricism

Tender-Minded (Metaphysicians)	Tough-Minded (Scientists)
Rationalistic (going by 'principles')	Empiricist (going by 'facts')
Intellectualistic	Sensationalistic
Idealistic	Materialistic
Optimistic	Pessimistic
Religious	Irreligious
Free-willist	Fatalistic
Monistic	Pluralistic
Dogmatical	Sceptical

The tender-minded approach, associated with speculative metaphysics, is where the axiomatic method is used: an *a priori* hypothesis of what *exists* (or another principle) is

assumed from which (the unity of) knowledge is deduced. For example, to unify the dual notions of mind and body Descartes assumed *a priori* the *existence* of God. The tough-minded approach, associated with science, is where *a posteriori* disparate facts are unified into a single theory. Though difficult to understand today, the relationship between speculative metaphysics and science was at the time analogous to the relationship between pure and applied mathematics; with speculative metaphysics providing "pure" proofs of, for example, the existence of God.

Hans Reichenbach (1951, 8) explained why there was a need for both analytic science and speculative metaphysics:

"Where scientific explanation failed because the knowledge of the time was insufficient to provide the right generalization, imagination took its place and supplied a kind of explanation which appealed to the urge for generality by satisfying it with naïve parallelisms. Superficial analogies, particularly analogies with human experiences, were confused with generalizations and taken to be explanations. The search for generality was appeased by the *pseudo explanation*. It is from this ground that philosophy sprang."

Classical German philosophers such as Humboldt, Schleiermacher, Fichte and Schelling applied the speculative metaphysical approach to the problem of understanding the unity of nature. Up to the late eighteenth century speculative metaphysics was the dominant approach to the problem of unifying knowledge – particularly in Germany.

Pierre Bayle was one of the first to sceptically dismantle speculative metaphysics at the turn of the eighteenth century (Engels 1949, 83-84). The turning point, however, came after German philosopher Immanuel Kant in the 1780's expressed scepticism about the speculative metaphysical approach: it was not rational science and was not even real knowledge. There were three primary reasons Kant used to renounce speculative metaphysics (Beck 1950, x-xii):

1. It was inconsistent since it could prove contradictory propositions;
2. It established propositions that were contradictory to the causality of nature (and, therefore, science);
3. Its propositions (e.g. substance is permanent, the soul is immortal, God exists) could not be derived from experience or logic.

Kant (1950, 114-115) suggested that the analytical method of *critique* was required to clean-out metaphysics in much the same way as chemistry did to alchemy, or as astronomy did to astrology.

Whilst Kant may have *logically* undermined speculative metaphysics within philosophical circles, the turning point in science occurred when Joseph-Louis Lagrange openly declared that theological and metaphysical speculation was foreign to science. Instead, he erected mechanics on new mechanical foundations that were adopted by all subsequent scientists of eminence (Mach 1919, 457).

3. The Parting of Philosophy and Science. The *practical* parting of philosophy and science occurred later at a time when Georg Hegel sought to gain the same level of acceptance for his idealistic philosophy in physical science that it had received in so-called moral science (e.g. theology, law, politics, language, art, history) (Helmholtz 1862, 78). The problem was that the natural philosophers (i.e. scientists) of the time thought his idealistic system of nature "absolutely crazy" (Helmholtz 1862, 80). Helmholtz (1862, 80) explained the reaction:

"…Hegel himself, convinced of the importance of winning for his philosophy in the field of physical science that recognition which had been so freely accorded to it elsewhere, launched out, with unusual vehemence and acrimony, against the natural philosophers, and especially against Sir Isaac Newton, as the first and greatest representative of physical investigation. The philosophers accused the scientific men of narrowness; the scientific men retorted that the philosophers were crazy. And so it came about that men of science began to lay some stress on the banishment of all philosophic influences from their work; while some of them, including men of the greatest acuteness, went so far as to condemn philosophy altogether, not merely as useless, but as mischievous dreaming."

The final overthrow of the Hegelian system occurred in Germany with the German revolution of 1848 (Engels 1892, 393; 1949, chapter 1). In its place arose a diverse variety of competing, eclectic, metaphysical philosophies (Engels 1892, 394). Observing the tension between science and philosophy, Claude Bernard (1957, 224) in 1865 stressed the importance of philosophy and science working together as one:

"Philosophy and science…must never be systematic: without trying to dominate one another, they must unite. Their separation could only be harmful to the progress of human knowledge. Striving ever upward, philosophy makes science rise toward the cause or the source of things. It shows science that there are questions beyond it, torturing humanity, which it has not yet solved. Solid union between science and philosophy is useful to both: it lifts the one and confines the other. But if the bonds uniting philosophy to science should break, philosophy, lacking the support or the counterpoise of science would rise out of sight and be lost in the clouds, while science, without guidance and without high aspiration, would sail at random."

Ultimately, however, science was uncomfortable with speculative metaphysics and sought to break away completely from top-down philosophy.

4. Rejection of Empirically-Led Synthesis. There are two types of top-down philosophy: principle-led synthesis and empirically-led synthesis. An example of principle-led synthesis is where *a priori* God is assumed to exist. Examples of empirically-led synthesis, even if only for part rather than all of science, are Einstein's special and general theories of

relativity: the synthetic hypotheses for these theories were based *a posteriori* on empirical findings.

In the rush for science at the turn of the twentieth century to completely break with speculative metaphysics, synthetic or top-down philosophy as a whole was rejected. This meant not only the rejection of speculative metaphysics, but also the implicit rejection of empirically-led synthetic philosophy (see Figure 1).

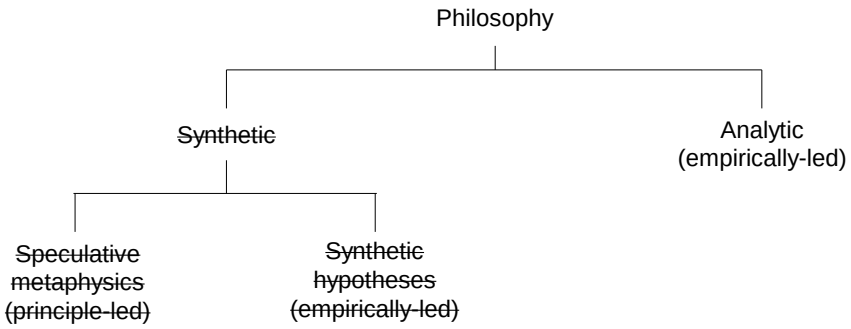

Figure 1. Rejection of Synthetic Philosophy

Instead of rejecting all of synthetic philosophy, science and philosophy should have embraced empirically-led philosophy and only rejected principle-led philosophy (see Figure 2).

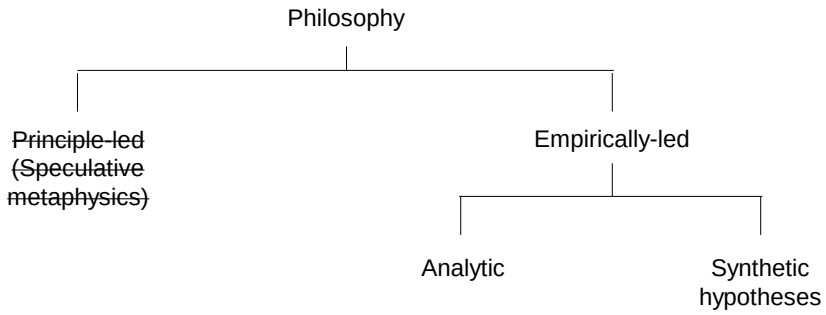

Figure 2. Rejection of Speculative Metaphysics

At the time Charles Peirce (Reynolds 2002, 14) and William James (1907; 1909) recommended that only principle-led philosophy (i.e. speculative metaphysics) be rejected. Such an approach would have led to a natural merger of philosophy and science where both disciplines seek knowledge of the real empirical world, the primary division of labour being between understanding the parts (science) and the whole (philosophy).

By the early twentieth century philosophy had been narrowed from the inclusion of synthetic philosophy (i.e. the study of the whole) to a focus on analytic philosophy (i.e. the

study of the parts). This led to Kant's *critique* and other analytic methods becoming the *raison d'être* of twentieth-century philosophy. With synthetic philosophy rejected, philosophy lost the role of providing a unified worldview. Instead, the interaction between philosophy and science became one of philosophy *analysing* the formal logical, semantics and algebraic structure of science. Bergson (1911, 208) concluded at the time:

"For having wished to prevent all conflict between science and philosophy, we have sacrificed philosophy without any appreciable gain to science."

Bergson (1911, 207) explained:

"What must the result be, if…[philosophy] leave[s] biological and psychological facts to positive science alone, as it has left, and rightly left, physical facts? It will accept *a priori* a mechanistic conception of all nature, a conception unreflected and even unconscious, the outcome of the material need. It will *a priori* accept the doctrine of the simple unity of knowledge and of the abstract unity of nature. The moment it does so, its fate is sealed. The philosopher has no longer any choice save between a metaphysical dogmatism and a metaphysical scepticism, both of which rest, at bottom, on the same postulate, and neither of which adds anything to positive science."

With science and, now, philosophy both being analytical disciplines, it did not encourage a solution to the problem of unifying knowledge, which also requires synthesis (understanding the whole). Some visionary scientists and philosophers identified this contradiction and directly or indirectly recommended the reintroduction of empirically-led synthesis.

5. Calls for Empirically-Led Synthesis. In 1930, Abram Deborin proclaimed the need for an alliance between philosophy and empirical science: one that (i) avoids the traditional non-factual metaphysical approach and (ii) eliminates the inadequate conception of empirical science without philosophy. To fill the gap, he suggested a general science of dialectics (Wetter 1958, 162-163). In 1933, Alfred Whitehead (1933, 187) discussed how philosophy (our universal intuitions) and science (our observations and inductions) are aspects of one great human enterprise:

"Of course in this action, and reaction, between science and philosophy either helps the other…science and philosophy mutually criticize each other, and provide imaginative material for each other…The history of thought is the story of the measure of failure and success in this joint enterprise."

Einstein (1944, 289) noted a malady in contemporary empirical philosophy: its fear of any type of metaphysics. He noted that this malady is the counterpart of the earlier philosophising in the clouds, which relied on thought alone and dispensed with sensual empirical experience.

Jacques Maritain (1951, 36-60) noted that whilst the ancient Greeks made the mistake of absorbing science into the philosophy of nature, contemporary science made the mistake of neglecting the philosophy of nature by absorbing it into natural science. This resulted in physical-mathematical knowledge being mistaken for *the* philosophy of nature (which naturally lead to a mechanistic worldview) and, thereafter, the philosophy of nature being excluded altogether. He argued that the philosophy of nature needed to be reinstated: the philosophy of nature was different from science on the one hand and metaphysics on the other. It provides the link between the world of each particular science and the world of metaphysical wisdom. Further, he noted, the philosophy of nature is at the heart of the hierarchical and dynamic organization of knowledge on which intellectual unity depends (Maritain 1951, 156). That is, the philosophy of nature explains how each particular science fits together with each other and with metaphysics.

In 1954, Bonifatii Kedrov argued that whereas each branch of science confines its activities to particular portions of reality and the understanding of the laws of those fields, philosophy's inquiries must be directed to the general laws of reality as a whole (Wetter 1958, 250). Similarly, John Smart (1963, 1-15) argued that philosophy ought to be more than the art of clarifying thought and diagnosing nonsense; it should concern itself with adumbrating a scientifically plausible worldview.

Ervin László (1972) argued that it is timely and, indeed, necessary to return from analytic to synthetic philosophy. Not only is there a wealth of scientific data that can form the basis for an informed philosophy, but also there is a wealth of philosophic methods and concepts available for the synthesis of scientific findings. In particular:

1. Contemporary "analytic" philosophy is in danger of "analysing itself out of existence." It has performed its important task of doing away with unproven and unprovable speculation, and "insistence on its methods now yields but professional *self*-analysis: philosophising with increasing logic but decreasing substance."
2. Nature is an interconnected system that needs informed generalists (such as a new breed of philosophers) to understand its interconnections, otherwise our limited analytical views of the world may lead to our own destruction;
3. What is needed, as hazardous as it may be, is a carefully reasoned "synthetic" philosophy that endeavours to put together the various islands of specialized knowledge into a coherent worldview. In particular, informed minds are required to "effect a *fusion* where today we only have *confusion*."

László, following his own convictions, developed a complete philosophy or worldview that he called *Systems Philosophy*. Similarly, Bernulf Kanitscheider (1988; 2001) argued that synthetic philosophy is needed over and above analytic philosophy to logically consider the big questions requiring a synoptic scientific worldview.

6. The Current State of Philosophy. These calls for *empirically-led* synthetic philosophy have largely gone unheeded. Instead, traditional philosophy has reached something of a dead end and is becoming divided into an increasing number of competing entrenched positions (Adamson 2002, 9). Traditional philosophy is now regarded more as a form of mental exercise than a source of knowledge (Adamson 2002, 2-3). Bayle (1965, xxiv), who wrote in 1697, best summarizes the crisis in philosophy:

"Philosophy at first refutes errors. But if it is not stopped at this point, it goes on to attack truths. And when it is left on its own, it goes so far that it no longer knows where it is and can find no stopping place."

Philosophy remains, like science, an analytic discipline. But philosophy cannot directly compete with science as a bottom-up analytic discipline, since it is not as close to the "coalface." Not surprisingly, Steven Weinberg (1992, 168-169), a leading proponent in the search for a theory unifying quantum theory and general relativity, has written of a puzzling phenomenon: the "unreasonable ineffectiveness of philosophy." He knows of *no one* who actively participated in the advance of post-war physics whose research has significantly benefited from the work of philosophers. Similarly, Michio Kaku (1994, 317) writes:

"Most physicists feel that, outside of vague notions of "truth" and "beauty," philosophy has no business intruding on their private domain. In general, they argue, reality has always proved to be much more sophisticated and subtle than any preconceived philosophy. They remind us of some well-known figures in science who, in their waning years, took up embarrassingly eccentric philosophical ideas that led down blind alleys."

Therefore, according to protagonists, while philosophy has value outside science, it cannot be expected, based on recent performance, to provide any useful guidance to scientists (Weinberg 1992, 166-167). Although this is a strong empirical argument, there is still a need for philosophy in science.

7. The Need for Philosophy. Science cannot do without philosophy (Haro 2013). If a change in *the* paradigm of science requires a change in the philosophy of nature underpinning science, then rejecting philosophy closes science to the possibility of a paradigm change. Now, Newton, Maxwell, Einstein and Schrödinger did not reject philosophy: instead, each had a strong interest in philosophy and each initiated paradigm changes. Newton read extensively including a lot of Greek philosophy. Maxwell was a member of the prestigious undergraduate society at the University of Cambridge called 'The Apostles' – which consisted of twelve members. "Discussions with his fellow Apostles helped Maxwell hone his views on the philosophy of language and reality" (Arianrhod 2003, 87). From 1902-1906, Albert Einstein and two friends established a discussion group called the Olympia academy to study philosophy (Einstein 1987, 8-15/143; Howard 2005, 35-36). Those that knew Einstein called him, in equal proportions,

the greatest natural philosopher and scientist of their time (Gonseth 1967, 7; Oppenheimer 1967, 8). Similarly, Schrödinger decided, prior to his major work in quantum mechanics, to temporarily pursue philosophy rather than physics (Kaku and Thompson 1995, 46). Some scientists therefore support a greater philosophical influence in physics. For example, Carlo Rovelli (2001, 102-103) writes:

"I am convinced of the reciprocal usefulness of a dialog between physics and philosophy…This dialog has played a major role during the other periods in which science faced foundational problems. In my opinion, most physicists underestimate the effect of their own epistemological prejudices on their research. And many philosophers underestimate the influence – positive and negative – they have on foundational research. On the one hand, a more acute philosophical awareness would greatly help the physicists engaged in fundamental research: Newton, Heisenberg and Einstein couldn't have done what they have done if they weren't nurtured by (good or bad) philosophy. On the other hand, I wish contemporary philosophers concerned with science would be more interested in the ardent lava of the foundational problems science is facing today. It is here, I believe, that stimulating and vital issues lie."

Given the foundational problems faced by science, there is a need for empirically-led synthetic philosophy in order to discover a new empirically-based philosophy of nature.

8. Conclusion. The top-down philosophic approach to the unity of knowledge problem was rejected outright at the end of the 19th century due to the speculative nature of principle-led philosophy. However, in the enthusiasm to reject principle-led philosophy, empirically-led synthetic philosophy and the philosophy of nature were also rejected. Since a change in *the* paradigm of science requires a change in the philosophy of nature underpinning science, the rejection of the philosophy of nature closes science to the possibility of a paradigm change. Given the foundational problems faced by science, there is a need for empirically-led synthetic philosophy in order to discover a new empirically-based philosophy of nature. Such a philosophy of nature may open science to the possibility of a paradigm change.

References

Adamson, Gregory. 2002. *Philosophy in the Age of Science and Capital*. London: Continuum.

Aleksandrowicz, Dariusz. 2001. *Realismus*. Disziplin, Interdisziplinaritat.

Arianrhod, Robyn. 2003. *Einstein's Heroes: Imagining the World through the Language of Mathematics*. St. Lucia: University of Queensland Press.

Beck, Lewis. 1950. "Introduction." In Kant (1950), x-xii.

Bergson, Henri. 1911. *Creative Evolution*. Transl. Arthur Mitchell. New York: Henry Holt & Company.

Bernard, Claude. 1957. *An Introduction to the Study of Experimental Medicine*. Henry Green, transl. New York: Dover Publications.

Cahan, David, ed. 1995. *Science and Culture. Popular and Philosophical Essays*. Chicago: Chicago University Press.

Callender, Craig and Hick Huggett, eds. 2001. *Physics Meets Philosophy at the Planck Scale: Contemporary Theories in Quantum Gravity*. Cambridge: Cambridge University Press.

Einstein, Albert. 1944. "Remarks on Bertrand Russell's Theory of Knowledge." In Schilpp, ed. (1963), 277-291.

Einstein, Albert. 1987. *Letters to Solovine, 1906-1955*. Wade Baskin, transl. New York: Philosophical Library.

Engels, Frederick. 1892. *Socialism: Utopian and Scientific*. Edward Aveling, transl. London: Sonnenschein.

Engels, Frederick. 1949. *Ludwig Feuerbach and the Outcome of Classical German Philosophy*. Moscow: Progress Publishers.

Gonseth, Ferdinand. 1967. "Einstein's Knowledge of Nature and Philosophy." In Maheu et al. (1967), 3-7.

Haro, Sebastian de. 2013. "Science and Philosophy: A Love-Hate Relationship." *Talk Delivered at the Conference Rethinking Liberal Education*. Amsterdam University College. June 15. PhiSci Archive Preprint 9864.

Helmholtz, Hermann von. 1862. "On the Relation of Natural Science to Science in General." In Cahan, ed. 1995. 76-95.

Howard, Don. 2005. "Albert Einstein as a Philosopher of Science." *Physics Today*. December. 34-40.

James, William. 1907. "Pragmatism: A New Name for Some Old Ways of Thinking." In Kuklick, ed. 1987. 479-624.

James, William. 1909. "A Pluralistic Universe." In Kuklick, ed. 1987. 625-820.

Kaku, Michio. 1994. *Hyperspace: A Scientific Odyssey through Parallel Universes, Time Warps, and the Tenth Dimension*. New York: Oxford University Press.

Kaku, Michio and Jennifer Thompson. 1995. *Beyond Einstein: The Cosmic Quest for the Theory of the Universe*. Rev. ed. New York: Doubleday.

Kanitscheider, Bernulf. 1988. "Wissenschaftstheorie und Naturphilosophie: Zur Typisierung Zweier Arten von Wissenschaftsphilosophie." *Philosophia-Naturalis*. 25: 346-360.

Kanitscheider, Bernulf. 2001. "Uber den Materialen Ursprung Philosophischer Probleme" In Aleksandrowicz, ed. (2001), 197-207.

Kant, Immanuel. 1950. *Prolegomena to any Future Metaphysics*. New York: Liberal Arts Press.

Kuklick, Bruce, ed. 1987. *William James: Writings 1902-1910*. New York: Literary Classics of the United States/Viking.

László, Ervin. 1972. *Introduction to Systems Philosophy: Toward a New Paradigm of Contemporary Thought*. New York: Gordon and Breach.

Mach, Ernst. 1919. *The Science of Mechanics: A Critical and Historical Account of its Development*. Fourth Ed. Thomas McCormack, transl. Chicago: Open Court.

Maheu, René et al. 1967. *Science and Synthesis.* Colloquium Organised by UNESCO to Mark 10th Anniversary of the Death of both Einstein and Telihard de Chardin. Berlin: Springer.

Maritain, Jacques. 1951. *Philosophy of Nature*. Imelda Byrne, transl. New York: Philosophical Library.

Oppenheimer, J. Robert. 1967. "Eisntein's Presence." In Maheu et al. (1967), 8-12.

Reichenbach, Hans. 1951. *The Rise of Scientific Philosophy*. Los Angeles: University of California Press.

Reynolds, Andrew. 2002. *Peirce's Scientific Metaphysics: The Philosophy of Chance, Law, and Evolution*. Nashville, Tn: Vanderbilt University Press.

Rovelli, Carlo. 2001. "Quantum Spacetime: What Do We Know?" In Callender and Huggett, eds. (2001), 101-122.

Schilpp, Paul, ed. 1963. *The Philosophy of Bertrand Russell*. Third Ed. New York: Harper & Row.

Smart, John. 1963. *Philosophy and Scientific Realism*. London: Routledge & Kegan Paul.

Weinberg, Steven. 1992. *Dreams of a Final Theory*. New York: Pantheon Books.

Wetter, Gustav. 1958. *Dialectical Materialism: A Historical and Systematic Survey of Philosophy in the Soviet Union*. Peter Heath, transl. London: Routledge and K. Paul.

Whitehead, Alfred. 1933. "Science and Philosophy." In Whitehead (1942), 179-204.

Whitehead, Alfred. 1942. *Adventures of Ideas*. Harmondsworth, Mddx.: Penguin Books.