

Mach, Russell, and Scientific Philosophizing: Re-visiting the Realistic Empiricism of Evolutionary Culture

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Abstract

Ernst Mach's and Bertrand Russell's philosophical outlooks contributed to shaping the philosophy of science of the 20th century. Mach is a philosophical interpreter of science, a positivist, and a historian, considering the general principles of science as condensed economic descriptions of observed facts. Russell held a view of the nature and relation of philosophy to science and to logic that can be described as essentially consistent. In this article, the aim is to explore how both Mach and Russell defended the classical version of "Neutral Monism". Since it was developed as a reaction to the mechanical philosophy of nature, Neural Monism also emerged along with scientific psychology in the late 19th century. The attempt in this article is to examine their versions of neutral monism and emphasize their differences and convergences.

Keywords: Russell, Mach, Neutral Monism, Elements, Sensations, Empiricism.

Russell's contributions to mathematical logic, academic and popular philosophy, and psychological and social issues are extensively recognized worldwide (Russell & Köllner, 1996). When asked to write about Bertrand Russell's contribution to the philosophy of science, following his death in 1970, Braithwaite wrote: "If mathematician Bertrand Russell and physicist Ernst Mach hadn't both resorted to 'scientific philosophizing,' the current status of philosophy of science would be drastically different." (Braithwaite, 1970:132) Hence, Russell's work in the field of epistemology/theory of knowledge cannot be examined independently of his 'scientific philosophizing', as Braithwaite argued.

Russell is well-known for his willingness to re-examine issues on which he has already published his views (Lader, 2011). However, a

closer look at his work shows that his basic viewpoint has changed very little, and wherever changes were made, they were largely due to a shift of interest rather than revisions of former opinions. (Russell, 2013: 474) He was a consistent advocate of the use of scientific methods in philosophy. But though science may refer to empirical sciences like chemistry or biology, it may also refer to formal sciences of logic and mathematics. (Russell, 2013: 481) He advanced his version of "neutral monism", while Ernst Mach and William James presented other versions of it. According to Russell's theory, there is no difference between mind and matter; they are essentially the same, for there is no fundamental difference in nature between mental events and physical events. Both 'mind' and 'matter' are logical constructions out of mental and physical events respectively. The essence of

this theory, which preserves the requirements of Ockham's razor is characteristically 'empirical'. Russell's scientific views comprise his attack on the problem of space, and space-time, using the topological method (Saborido, et al., 2011). He decided the necessary conditions of events to produce a continuous space-time.

Russell looked at "causality" as a matter of regular sequence or conjunction of events, which reflects a clear influence of David Hume (Groff, 2011). He did not, however, share Hume's propensity for skepticism about the physical world. Russell believes that science provides us with comprehensive knowledge of what exists outside of our thoughts, a reality that is indisputable and unavoidable. (Gregory & Zangwill, 1987: 688). The idea of 'separable causal lines' played a significant role in his attempt to validate scientific methods. Braithwaite further explains: "Instead of viewing Russell's intriguing analysis of the scientific method as a defense of it, one should view it as an examination of the role of separate causal lines in our understanding of nature." (Braithwaite, 1970: 132).

Hence, for Russell, 'experience' is characterized as continuous and atomistic. He distinguished between what is given and what is inferred, and Hume's influence is present throughout. It is beyond the scope of this paper to highlight all of Russell's achievements in the fields of philosophy, science, and mathematics (Priest, et al., 2006). In the case of philosophy, it is well known that Russell's approach to some fundamental philosophical issues, such as the nature of universals and the boundaries of empiricism, changed significantly during his life. However, he remained committed to the analytic method, empiricism, and realism. (Byrne, 1970: 144)

As for Mach, he was committed to an empiricist vision of science, and is renowned as "one of the most effective fighters in the empiricist challenge to notions implying "absolutes" that had infected nineteenth-century science (e.g., absolutes of space, time, substance,

vital force) ..." (Holton, 1992: 28) He tackled problems that arise in physics and other sciences such as psychology, biology, focused on scientific methodology and considered metaphysics as deceptive knowledge. He held that the method of attaining knowledge can be certified. However, the resulting knowledge cannot. Furthermore, he inquired into the empirical as well as the metaphysical aspects of scientific ideas. In this pursuit, Mach offered a philosophical analysis of science that was less dependent upon his critical analysis of metaphysics. (Cohen, 1970: 132, 135).

A potential problem for this study is to investigate the challenge that natural selection theory faces in explaining cultural evolution. Problems with methodology may arise when trying to determine how best to put the theories and hypotheses put forth in the study to the test about the practical empirical evidence of evolutionary culture. Also, skeptics who see the study as oversimplifying cultural evolution processes and proponents of the empirical theory of evolutionary culture may find themselves at philosophical odds over the study's conclusions. whereas theoretical hurdles Rethinking the relevance of natural selection in this study's setting is necessary because it may be difficult to apply these notions to cultural evolution.

Consequently, the goals of this study are to solve this dilemma, add to our theoretical and practical knowledge of how cultures evolve, and stimulate fruitful discussion among scientists.

Theoretical literature

Mach, science, and philosophy

Let us start by pointing out that Mach's conception of philosophy is essentially positivistic, whereby philosophy aims to systemize particular/special sciences into a whole. Philosophy cannot venture into unknown realms and suffices itself with phenomena, appearances, or sensations (Harman, 2011).

For Mach, the essence of science is considered as "a means by which we are spared

direct experience.” (Carus, 1906) He considers the whole of reality as sense –perception and deems the distinction made between objects and sense-impressions as prohibited. He viewed sense impressions as containing reality in their full and the role of science to analyse and explicate sense-perceptions. In his “Contributions to the Analysis of Sensations”, Mach argues that if the world consists of sensation, then the work of science can only be an analysis of sensations. Sensations alone are real, and our ideas are purely mental symbols (Ratcliff, 1970).

It can be argued that our mental constructions have some objective validity. They are not purely subjective constructions of what we call things and their interrelations. Mach also claims that our thoughts are imitations or remodeling of facts.

In this context, our sense-perceptions compose what is real and the role of theoretical terms is to facilitate the analysis of sense-perceptions and determine the interconnection of their elements. However, it can be argued that while our formulation of universals is subjective, there is an objective feature in the world to which they correspond, thus, their formation is justified.

It can be argued that Mach’s belief in his elements was stronger than Hume’s belief in impressions, since for Hume the sensations occur in space and time. Ideas are copies of impressions, which are more vivid, clear, and distinct than ideas. Hence, they have higher epistemic value. For Mach, the variety of individual qualities establishing the world at any second appeared suddenly and then disappeared, never to recur in the same manner. (Banks 2004, 25) In addition, Mach disagreed with Hume’s principle that every impression led to an independent existence from the others. By contrast, Mach’s elements showed a reciprocal functional dependence on one another. (The Analysis of Sensations (New York: Dover, 1959), pp. 362-363.

Also, Mach thought of relations between elements as ‘given’. He suggested in his *Mechanics* (1882) and *Theory of Heat* (1896) that scientific investigators could learn to perceive relations directly. (Banks 2004, 26)

Sensation / element

In his classic “The Problems of Philosophy” (1912), the relation of mind and the objects confronted by it is called “acquaintance” and it happens in sense-perception. Russell writes: “All cognitive relations-attention, sensation, memory, imagination, believing, disbelieving, etc.-presuppose acquaintance”. (Russell, 1914 c, 1)

Hence, “Sensation and perception can be differentiated by stating that sensation provides specific details, whereas perception provides objective information. In this context, introspection solely comprises perceptions, not sensations.” (Russell, 1914 d, 441) Accordingly, the immediate objects of perceptual familiarity are external to the mind and are a part of the physical world, which we are aware of thanks to our senses.

The components, i. e., building blocks, of the physical world are “sense-data”, which are presented to our minds. “Sensibilia” as the unsensed appearances of physical objects were introduced by Russell to account for treating a physical event as a “centre from which lines of appearances radiate outwards in physical space”, where sense-data presented to our minds are only a small portion of these appearances. (Gregory & Zangwill, 1987: 689) In this context, the difference between sensibilia and sense-data remains unclear. How can both be of the same kind of thing? Also, when considering perceptual relations and perceptual objects (sense-data & sensibilia) as the only basis upon which all other objects and relations are defined, one might question the possibility of this construction. (Russell, 2017: 622) Russell, like many of his fellow empiricists, regarded sensations as the source of evidence, in whatever field we may inquire. Furthermore, sensations can only disclose what is accessible to them.

Mach's initial theory of components was an attempt to eliminate useless metaphysical concepts of "mind" and "body" and to unite physics and psychology into a wide scientific perspective that could then be utilized in any field of study. The components of minds and bodies were neither physical objects in space and time nor mental sensation qualities in and of themselves; rather, they were neutral between the two domains and were distinguished proviso by designating one type of variation of the components as "mental" and another type of variation as "physical." (Banks, 2003, pp. 16, 310–311; Russell, 1914/1984, 1921, 1927/1959). (Banks, 2010, 173).

Mach's commitment to the neutral word 'element' rather than 'sensation' allows him to make assertions neither about objects nor about ego-centric worlds. Hence, the notion of neutral 'elements' was the basis of his philosophical achievements. For him, Cohen argues, "science is an attempt to offer descriptions of the 'elements' in a language of functional dependence, economically, comprehensively, and simply." (Cohen, 1970: 134) Hence, Cohen continues, Mach regarded knowledge as sensational; consequently, metaphysics was speculative and far from being considered as knowledge. Hence, metaphysics does not produce knowledge and causes deception in its claims. Furthermore, it led to the instillation of the dualism of mind and matter into the natural world. Hence, the role of science is limited to the description of the world as experienced by us. (Cohen, 1970: 138) Mach writes: "Explanation is nothing but condensed descriptions." (Cohen, 1970: 142) He uses 'elements' and refers to them as sensations, but what is the difference? Elements are given in experience. They establish experience. Here, it is clear that the subjective factor is prominent. Several questions arise: Are elements equivalent to atomic experiences or sensations? (Cohen, 1970: 154)

Furthermore, elements are neither mental nor physical; they follow logical and mathematical arrangements. Perry asserts that Mach's elements

can be analogously juxtaposed with the principles and entities of physics, biology, or psychology. Mach's positivism aligns with logical realism. (Lovejoy, 1912: 78-79) Hence, Cohen views Mach's logical realism as compatible with Russell's sensationalism. (Cohen, 1970: 154)

It must be noted that science is not concerned with explaining the existence of these elements, it only recognizes them as the ultimate given in experience (Larkin, et al., 2006). Mach conceives the world as a totality of elements that are related in various ways. The task of science is to determine these connections and interrelationships. These relations exist only between elements. He does not admit the existence of substances and thus does not consider elements as dependent upon substances. (Becher, 1905: 539) The notion of substance does not meet the demands of scientific thinking. Neutral Monism:

Russell accepted neutral monism during his middle era, which rejects any irreducible distinction between the mental and physical (Russell, 2022). Accordingly, it builds the mental and physical worlds out of elements that are neither mental nor physical but rather neutral. It was suggested that neutral monism may be used to address the issues with dualism (Backhaus, 1991).

To address not only sensations but also beliefs, desires, and other comparable phenomena, neutral monism tries to address the issues of perception. Consequently, there are two ways that sensations can be organized to create physical objects and minds. However, it is challenging for a neutral monist to demonstrate that the foundation of the mental universe is impartial, particularly when it comes to beliefs and desires. Because neither of these can be built from *sensa*. Instead, Russell turned to "images," yet it's unlikely that images are fundamentally similar to *sensa*.

Throughout his philosophy, Russell adhered to atomistic empiricism, while significant changes are taking place in his theory of

knowledge. His adoption of neutral monism is one clear example. (Byrne, 1970: 142) To be able to arrive at this position, he had to forsake the distinction between “sensation” and “sense-datum”. (Griffin, 2013: 578)

The roots of neutral monism were engrained in Ernst Mach’s important work “*Die Analyse der Empfindungen*” (1886). Cory argues that Mach, James, and later Perry and Holt have all agreed on discarding the distinction between the act of consciousness and its objective content, whereby the objective content of experience is the physical environment. However, Russell considered the ‘objective content’ of experience as placed in the brain of the recipient. (Griffin, 2013: 579)

In 1914, Bertrand Russell, in his “On the Nature of Acquaintance II: Neutral Monism”, gave this name to Mach’s philosophical position generally known as “neutral monism”. As mentioned above, neutral monism holds that minds and material objects are both composite objects made from the same neutral material, which Mach called elements.

An element was a sensation when it varied with the human nervous system, but when it occurred in a physical variation independent of the human sensory apparatus it was called a ‘physical object’ (Banks, 2004). It is often thought that these elements must be sensations perceived by human beings before they can be interpreted in their physical variations as elements (Coren, et al., 2004). If so, then there would be no truly physical elements; they would all be sensations of a human observer considered as varying independently of his other sensations.

The crucial interpretive issue about whether Mach’s elements are realistic or merely embedded in another form of idealism comes down to the question of whether he believed in elements that are not human sensations under any interpretation. Like Russell’s unsensed sensibly, Mach’s elements comprised physical qualia in nature that persisted even in the absence of conscious observers.

Hence, Banks define elements as entities possessing significant causal influence. Concrete qualities and dispositional ways refer to specific characteristics and tendencies that have an impact on things in their different causal or functional roles. Moreover, each constituent is inherently integrated within its functional role. (Banks, 2010, 175) Thus, Banks adds that Mach’s elements include the following classes: The ego; the perceived object; and the ego and perceived object as two functionally related complexes of elements. Sensations and mental images fall under the ‘ego’. Sensations which are also physical elements fall under ‘perceived objects’. (Banks 2004, 41) Furthermore, Banks argues that Mach also held that one could infer sensations in matter by analogy, by beginning with sensations in humans and animals and extending the analogy to plants and finally to inanimate matter, an argument he used several times despite its tenuous nature.

Mach’s remarks reveal the course of his thought away from the science of physics towards the concreteness of psychophysics and its ability to reveal the qualities of experience. Based upon this view, Mach could be interpreted as believing that the fundamental constituents of the world are very minute neutral ‘qualities’ that make up physical objects in the external world. These qualities are known to us directly only when comprising our sensations and other psychical states and indirectly by means of the causal relations of these elements to the sensibly attached to them. Can Mach be considered as epistemologically skeptical about world elements?

However, as stressed by Mach and Russell, the perception of green is equivalent to a certain neuronal energy of the brain. The sensation quality is the brain’s owner’s expression of this neuronal buildup and their combined neural energy. Russell’s statement that “what is experienced may itself be part of the physical world and often is so” is indicative of this.” (Russell, 1914/1984) Red can be interpreted as a sensational characteristic or as a natural object

that participates in physical processes and changes. Depending on whether it is being used in a physical or psychic context, it can be seen as either an ingredient or an experience in and of itself (Banks, 2010, 176).

Bertrand Russell took Mach's neutral monism most seriously among his contemporaries and presented his theory of acquaintance in 1914. In the 1920s he converted to it himself and recognized Mach as a direct realist.

In retrospect, Russell was probably Mach's best critic as he pursued a similar course in the *Analysis of Mind* (1921) and the *Analysis of Matter* (1927).

Like Mach, Russell also criticizes physical science for excessive abstraction from nature (Banks, 2004). He says that physical science deals with the 'causal skeleton' of events, describing certain quantitative relations between events that hold over various times and places. It must be added that both Russell and Mach credited physiological psychology as making most of the breakthroughs in discovering qualities of the physical world.

We might underline the theory's extremely large simplification, which is a point in its favor. Our intellectual needs are far less satisfied when we think of the things we experience as being of two fundamentally different kinds, mental and physical.

The truth-seeker Russell admits that neutral monism has contributed significantly to philosophy. He does, however, highlight some of the issues that it could not resolve and the realities that it was unable to account for.

First, according to introspection, there doesn't seem to be a difference between a color that is seen and a color that isn't seen based on relationships to other colors, other experience objects, or the nervous system. "If neutral monism were valid, it would be logically impossible for a mind to have only one experience, as something is only considered mental due to its external relationships. Consequently, this philosophy struggles to

define how the entirety of my experience differs from the things that exist beyond my experience." (Russell, 1914: 185)

The notion primarily developed in opposition to the idea that external objects may only be directly perceived via the use of subjective "ideas" or "images." However, it shares with this viewpoint the belief that everything a person perceives must be a product of their mind. When this belief is disproved, much of this belief's believability disappears.

Secondly, difficulty is derived from belief or judgment. Error is defined as 'belief in the unreal,' which compels the admission that there are unreal things.

A third difficulty is that the "thought of what is not in time, or a belief in a non-temporal fact, is an event in time with a definite date, which seems impossible unless it contains some constituent over and above the timeless thing thought of or believed". (Russell, 1914: 186) He asserts that while neutral monism offers a compelling critique of previous theories, it falls short in its ability to account for all the observed phenomena. Therefore, it should be replaced by a theory that emphasizes and simplifies the distinction between what is experienced and what is not experienced by an individual at a particular moment. This new theory should avoid completely denying the existence of mental entities." (Russell, 1914: 187).

Methodology

The methodology followed in the paper "Mach, Russell, and Scientific Philosophy: Reconsidering the Realist Empiricism of Evolutionary Culture" can follow several steps. Where the literature was reviewed, this step included studying and analyzing previous research and theories related to the topic, including the works of Mach and Russell and research that addressed the topic of realist empiricism of evolutionary culture.

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The qualitative approach was also used, where the theoretical framework was determined. In this step, the theory or theories that will be used as a basis for the research are determined, while clarifying the conceptual framework that will be used to understand and interpret the phenomena studied in Comparing the Philosophy of Mach and Russell and Scientific Philosophy: Reconsidering the Realistic Empiricism of Evolutionary Culture.

Results

Empiricism does not oppose realistic empiricism: realistic empiricism insists on entity realism regardless of accepting or rejecting the scientific laws' representation of nature. Hence, realistic empiricists insist on accepting the existence of entities and regard our representations of these entities as real. Although Mach goes with empiricism, he is an entity realist as is Russell.

In general, empiricists hold that regardless of accepting or rejecting a realist perspective of natural law, scientific representation of natural phenomena is accepted only if it works. Thus, scientific rules and theories are valuable because they are cheap tools for dealing with the accumulated individual results and because they are practical and operationally fruitful. The rules of nature, according to Mach, are "merely subjective prescriptions for an observer's expectations to which reality need not conform," and the only way to determine their worth is to see if they are ultimately fulfilled. Such a seemingly pure instrumentalist view leaves no space for any kind of scientific realism. On the

other hand, Russell regarded what are known to be laws of nature as human conventions.

To explain the visible ones, scientists seek accurate descriptions of the unobservable processes. The study of nature has traditionally been guided by empiricism as its primary philosophical framework. Just to provide an accurate description of the observable world, theories are necessary. A theory of language and meaning was added to this empiricist perspective when logical positivism expressed it, along with a broad linguistic orientation. Scientific realism, which emerged in the modern era, is in opposition to positivism and all of its beliefs, including the one about meaning that was just stated (Russell & Blackburn, 2020).

Russell had a concern for simplicity in much of his philosophical works; particularly in his theory of definite descriptions, logical atomism, and neutral monism, where he applied 'Ockham's Razor': the principle of economy of thought. This law of the economy of thought has a role to play in Mach's introductory essay ("Mach's Theory of Economy"), which focuses on the conception of the "economy of thought". Concerning the logical simplicity of theories, Mach makes the realist's point that the object of inquiry determines the appropriate degree of complexity: a theory should be as complex as the matter calls for. Mach adds to the rule of economy of thought, his most important conception of investigation: "... the principle of the complete parallelism of the psychical and the physical ... which recognizes no gulf between the two provinces ..."

In "On the Origin of Species," Darwin lays down the groundwork for his hypothesis of evolution by natural selection. As a picture of human evolution, empiricists will embrace the theory of evolution. There are truly two paradigm shifts occurring now: one in species and one in species realism, brought about by Darwin's new assertions of gradualism and evolution, which are backed by empirical evidence. There are two stages to Darwin's transformation. The first thing he does is make

some new assertions about nature. He says that species can change and evolve throughout time, rather than that they are immutable and different.

While highlighting the shift from "classical Darwinism" to "modern Darwinism," Helen Cronin's contentious book "The Ant and the Peacock: Altruism and Sexual Selection from Darwin to Today" included contentious passages. Classical Darwinism places a premium on the individual organism as a unit of selection. Even classical Darwinism's understanding of adaptation was severely lacking. Instead of focusing on how these "strategies" stack up against one another, it emphasized how simple structures, and, to a lesser degree, behavior might be useful.

Despite Cronin referring to the success of modern Darwinism as a scientific revolution, she is not implying that the event was illogical or that the two ideas cannot be compared. Similar to how the logical empiricists perceived the transition from Newtonian to relativistic mechanics, she envisions classical Darwinism smoothly reducing to modern Darwinism. For some limited set of circumstances, the old theory provides a reasonable approximation of the new one.

Conclusion

Based upon his extensive philosophical inquiry, Russell moved from 'dualism,' which endorses an enigmatic interaction between the mental and the physical to neutral monism. In contrast to idealistic and materialistic monism, he advocated neutral monism. "Things commonly regarded as mental, and things commonly regarded as physical do not differ in respect of any intrinsic property possessed by the one set and not by the other but differ only in respect of arrangement and context," the authors write (Russell, 1914: 161).

It is shown that the roots of Russell's neutral monism, which is considered a solution to the problem of the relationship between mind and matter, were embedded in Mach's "Analysis of

Sensations". However, having presented his version of the theory, Russell ended by raising objections against all versions of neutral monism that are far from being resolved today.

Some have regarded neutral monism as an idealistic doctrine in which both sensations and physical elements are conscious sensations. It is evident that the concepts applied in neutral monism are rather alien to those used in contemporary discussions and may lead to serious misunderstandings. There are several versions of the theory, and some versions have mounting panpsychism dash that might sound less promising for current debates in metaphysics and the philosophy of mind.

Nowadays, it seems highly unlikely to witness a renewal of neutral monism in the context of contemporary philosophy of mind. The issues it raises remain of lasting importance and deep concern to those interested in "scientific philosophizing".

Research Contribution

The research "Mach, Russell, and Scientific Philosophy: Reconsidering the Realist Empiricism of Evolutionary Culture" focuses on examining and analyzing the philosophical theories of Michael Mach and Marcus Russell. It explores how these theories impact the realist empirical perspective of evolutionary culture within the social sciences. He contributes to the deep philosophical discussion over the theoretical basis of realist empiricism and its significance in comprehending and analyzing cultural and social progress.

Potential contributions of the research may include the review and analysis of scientific philosophical theory: This study looks at how the ideas put out by Mach and Russell shaped the evolution of experimental and scientific methods used in the social sciences. Examining topics like ideology and social dominance, the research offers a critical analysis of realist empiricism as an explanatory framework of evolutionary culture. The study looks at the similarities and contrasts between scientific philosophy and

practical empiricism, comparing the two schools of thought.

The research may apply the suggested theory to a particular case study within the social sciences to demonstrate its applicability to scientific inquiry and the comprehension of social phenomena. In sum, the study's original contribution is a critical evaluation of social science realism and empirical philosophy, as well as new obstacles and opportunities for the philosophical study of social evolution and cultural practices.

Author contributions

All of the mentioned authors contributed significantly, directly, and intellectually to the

work and gave their consent for it to be published.

Conflict of interest

The study's authors affirm that there were no financial or commercial ties that might be viewed as having a potential conflict of interest.

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