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WHAT DOES THE CONTINUITY THESIS REALLY MEAN IN QUINE'S PHILOSOPHY?

Serdal TÜMKAYA*

ABSTRACT

The continuity thesis (CT) does not suggest that the similarities between science, common sense, and philosophy are much more than its opponents might claim. Under its Quinean motivation, CT is used to suggest a normative idea concerning how to do philosophy; it is not a descriptive thesis about the actual relationships between philosophy, common sense, and science, except the historical and developmental origins of them. CT is not primarily a descriptive thesis on the similarities between science and non-science. It is, however, based upon another descriptive, closely related thesis: starting from the middle. All thought, human and animal, scientific or not, begins from an inherited mass of knowledge, assumptions, and a surrounding general framework. There is no cosmic exile, Archimedean point, and "view from nowhere." This is an observation for Quine and underlies his attack against the analytic and the synthetic distinction; his defense of holism and of empiricism which in combination yields Quinean naturalism. Thus, CT should be considered as the ultimate expression of Quinean naturalism and cannot be invalidated by showing the vast differences, even occasionally outright opposition, between science, common sense, and philosophy. Neither does it imply that philosophy must be assimilated into science without a substantial shift in the present notion of science.

Keywords: The continuity thesis, Quine, starting from the middle, cosmic exile, common sense, scope of science

QUINE'IN FELSEFESİNDE SÜREKLİLİK TEZİNİN GERÇEK ANLAMI NEDİR?

ÖZ

Süreklilik tezi (ST); bilim, sağduyu ve felsefe arasındaki benzerliklerin, rakiplerinin iddia edebileceğinden çok daha fazla olduğunu öne sürmez. Quinecı motivasyon altında ST, felsefenin nasıl yapılacağına ilişkin normatif bir fikir önermek için kullanılır; ST felsefe, sağduyu ve bilim arasındaki gerçek ilişkiler hakkında, bunların tarihsel ve gelişimsel kökenleri dışında, tanımlayıcı bir tez değildir. ST, öncelikle bilim ve bilim dışı arasındaki benzerlikler üzerine tanımlayıcı bir tez değildir. Bununla birlikte, ST kendisiyle yakından ilişkili başka bir tanımlayıcı teze dayanmaktadır: ortadan başlamak. Bilimsel olsun ya da olmasın, insani ve hayvani tüm düşünceler, miras alınan bir bilgi yığınından, varsayımlardan ve onu çevreleyen genel bir çerçeveden başlar. Kozmik sürgün, Arşimet noktası ve "hiçbir yerden görüş" yoktur. Bu, Quine için bir gözlemdir ve onun analitik ve sentetik önermeler arasındaki ayrıma karşı saldırısının temelini oluşturur; holizm ve ampirizm savunması, kombinasyon halinde Quinecı natüralizmi bize verir. Bu nedenle ST, Quinecı natüralizminin nihai ifadesi olarak düşünülmelidir ve bilim, sağduyu ve felsefe arasındaki büyük farklılıkları, hatta bazen büyük karşıtlığı göstererek geçersiz kılınamaz. ST mevcut bilim anlayışında önemli bir değişiklik olmaksızın felsefenin bilime asimile edilmesi gerektiği anlamına da gelmez.

Anahtar sözcükler: süreklilik tezi, Quine, ortadan başlamak, kozmik sürgün, sağduyu, bilimin kapsamı

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* Dr. Öğr. Üyesi / Asst. Prof. Dr. Ibn Haldun University, İTBF, Department of Philosophy, İstanbul / Türkiye.
ORCiD: 0000-0002-2453-4184; serdal82@gmail.com
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Introduction: What is the continuity thesis?

Quine is famous for his many slogans and ideas. One of them is the continuity thesis (CT), which claims the continuity of philosophy and common sense with science. Though being a very central element in his web of ideas, CT has, intriguingly, not been given sufficient attention in the literature.[1] His challenge against the analytic-synthetic distinction, his thoroughgoing empiricism and his leadership in scientific naturalism do stand out for philosophers, but not CT. However, Quine frequently puts CT at the heart of his naturalism.

The main problem in reconstructing Quine's line of reasoning and figuring out his true idea is that his whole discussion of CT sometimes becomes much too vague and general.[2] He frequently uses suggestive metaphors, such as "web of belief," "cosmic exile," "Archimedean point," and "starting from the middle." I try to unpack these metaphors and explain what Quine is getting at in different words instead of uncritically using them. "Starting in the middle" is one of the more obscure Quinean notions, a descriptive thesis, without much clarification.

Quine never truly elaborates on CT, but we find many pieces in his writings that allow for a reconstruction of CT. The problem that CT addresses is the relationship between philosophy, common sense, and science. The most concrete example Quine gives to illustrate his attitude towards the relationship between philosophy and science is his suggestion that we should place epistemology under the heading of psychology.[3] One other suggestion is that we freely use whatever is the best science available in our philosophical theorizing. It may be from any academic discipline, including sociology, history,

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1 For an exception, see Paul Hoyningen-Huene, *Systematicity: The Nature of Science* (New York: Oxford University Press, 2013).

2 Editors, "Introduction," *Grazer Philosophische Studien* 66, no. 1 (2003): 1–5, https://doi.org/https://doi.org/10.1163/18756735-90000808; Bredo C. Johnsen, "Reclaiming Quine's Epistemology," *Synthese* 191, no. 5 (2014): 961–88, https://doi.org/10.1007/s; Bredo C Johnsen, "How to Read 'Epistemology Naturalized,'" *Journal of Philosophy* 102, no. 2 (2005): 78–93, https://doi.org/10.5840/jphil200510221; Paul A. Roth, "The Epistemology of 'Epistemology Naturalized,'" *Dialectica* 53, no. 2 (2005): 87–110, https://doi.org/https://doi.org/10.1111/J.1746-8361.1999.TB00066.X.

3 Hilary Kornblith, "What Is Naturalistic Epistemology," in *Naturalizing Epistemology*, ed. Hilary Kornblith, 2nd ed. (Cambridge, MA: MIT Press. A Bradford Book, 1994), 1–14; Hilary Kornblith, "Philosophy, Science, and Common Sense," in *Scientism: Prospects and Problems*, ed. Jeroen de Ridder, Rik Peels, and René van Woudenberg (New York: Oxford University Press, 2018), 127–48.

evolutionary biology, or quantum mechanics.[4] Still another suggestion is to try to reformulate problematic concepts in order to make it more amenable to empirical treatment.

Eliminating philosophy as a discipline has never been a part of Quine's CT.[5] Eliminating untestable ideas though, seems appealing. It is certainly not what Quine would defend given that they are a major source of testable hypotheses, filling out interstices of theory. Making a rigid hierarchy among sciences is also a tendency with which Quine largely disagrees. As is well known, for Quine, science is a very inclusive notion.[6]

Testability is something one would reasonably want from science, but not a necessary component of it: "I said that prediction is not the main purpose of science, but only the test. It is a negative test at that, a test by refutation."[7] In parallel, common sense as rudimentary science and unregimented discourse, engages with expectation and fulfillment, which is tacit prediction analogous to scientific predictions. In philosophy, predictions become logical entailments and logic is integral to science; our theory of the world. Bad metaphysics, religion, poetry, and fiction are not sciences even in the broadest sense of the word. They do not have any direct or even indirect links to prediction. Quinean testability is extremely broad compared with that of logical empiricism. But, says Quine, much good science is untestable even in this broader sense.

These ideas strongly imply that when Quine states that philosophy is continuous with the rest of science, he has a radically inclusive notion of science that makes his CT weaker than many would think. Because there are so many philosophers who only consider natural sciences as science or assume that naturalist philosophers consider only natural sciences as science, the continuity thesis seems wild to the majority of mainstream philosophers. How could the almost totally counter-intuitive theory of quantum mechanics ever be continuous, in any relevant sense, with what analytic philosophers typically put

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[4] James Ladyman, "Scientism with a Human Face," in *Scientism: Prospects and Problems*, ed. Jeroen de Ridder, Rik Peels, and René van Woudenberg (New York: Oxford University Press, 2018), 106–26.
[5] Compare Luciano Floridi, "What Is A Philosophical Question?," *Metaphilosophy* 44, no. 3 (April 1, 2013): 195–221, https://doi.org/10.1111/meta.12035.
[6] "Naturalism; Or, Living Within One's Means," *Dialectica* 49, no. 2–4 (1995): 251.
[7] 256.

forward as philosophical theories? In a very abstract or general sense they might be continuous, but I am not interested in an utterly abstract sense of the word.[8]

What seems close to philosophy or common sense is primarily human and social sciences. How could this be otherwise? Just think about the vocabulary and framework that we use in our daily interactions. Folk psychology is the widespread name philosophers call this framework. Its vocabulary includes the terms "belief," "desire" and the like. We see these terms all over the human and social sciences. I do not deny that the current sciences of human mind and behavior are much more complicated than the folk psychology that is used by laypeople, but human science does still use the same general framework as traditional folk psychology. This will, however, probably change, but nevertheless, for the current situation most aspects of human science are continuous with philosophy at its best.

At an intuitive level we can reasonably claim that the same continuity can be seen between human science and life sciences, life sciences and chemical sciences, chemical and physical sciences. The adjacent disciplines could easily be seen as continuous even though the distant parts seem radically different. The notion of continuum involves change as an integral part. Uniform changes, however small, might result in differences in kind.[9] The Quinean CT is not even a thesis about the scale of similarities or differences. It is a normative idea about how to do philosophy. Also, it is quite a liberating idea, not a scientistic one, given that Quine conceives science extremely broadly. I now turn to what CT means as a normative idea, and what supports it.

CT as a normative idea

CT could either be read as a surprisingly liberal idea or a scientistic one. A radical reductionist may see it as a pointlessly relaxed position. Conversely, one might think that the thesis implies the legitimacy of scientific imperialism. The proper reaction against CT would be a function of an individuals' unique conception of science, especially of the extension of science. This is certainly key to understanding the true meaning of the thesis.[10]

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[8] cf. Johan Hietanen et al., "How Not to Criticise Scientism," *Metaphilosophy* 51, no. 4 (2020): 538–39, https://doi.org/10.1111/meta.12443.
[9] Cf. K Brad Wray, "Systematicity and the Continuity Thesis," *Synthese* 196, no. 3 (2019): 819–32, https://doi.org/10.1007/s11229-016-1088-y.
[10] See Hietanen et al., "How Not to Criticise Scientism."

Does Quine try to give an accurate picture of how similar or dissimilar science and philosophy are, or does he aim to persuade philosophers or scientists to change their practices in a certain way? First, I will examine whether it is plausible to think of CT as descriptive and true, given that the sciences display a bewildering variety of methods, concepts, tools, and levels of explanation.[11]

It would not be wise to accuse one of the most influential analytic philosophers of the second half of the last century of simply being descriptively mistaken. Nor would it be wise to simply conclude that as he talks very abstractly, that would make his thesis merely trivially true. Nor would it be philosophically valid to solve the apparent tension between Quine's scattered remarks and his proclaimed position by saying that he uses the terms atypically or ambiguously, although he may indeed be simply mistaken at the descriptive level.

In the end, any one of these, or some combination thereof, may turn out to be true. However, this is not the point where I should start my investigation. In any case, it is Quine himself who acknowledges that sciences are not unitary and that the joints between them are loose: "Science is neither discontinuous nor monolithic. It is variously jointed, and loose in the joints in varying degrees."[12] He also notes, in passing, that many of the claims of the basic sciences are alien to common sense, especially at the ontological level. Although these kinds of remark suggest that science and common sense are discontinuous, Quine thinks differently. So, how did he defend for decades the continuity of science, common sense, and philosophy? Which reading of the thesis would make it both true and interesting?

My answer is that Quine's thesis is initially descriptive and a little abstract, mainly grounded on the fact that continuity does not deny change, even major change.

Certain aspects of science might be foreign to commonsense, although also an outgrowth of it. One such aspect Quine gives as an example is ontological concern.[13] Since Quine's naturalism is more methodological than ontological,

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11 David Spurrett, "Philosophy Enough. [Inaugural Lecture]," *South African Journal of Philosophy* 28, no. 1 (2009): 47–68.
12 "On Empirically Equivalent Systems of the World," *Erkenntnis* 9 (1975): 314.
13 *Theories and Things* (Cambridge, Mass: Harvard University Press, 1981), 9.

the recognition that science can be foreign to common sense at the ontological level is not crucial. It is the methodological dimension about which Quine constructs his ideas. Here at the methodological level, the continuity thesis becomes a normative idea.

Before turning to Quine's normative continuity thesis, let me note something especially important. The continuity thesis was never meant to be a version of the unity of science thesis.[14] Quine sees the latter as a dream of logical positivism. True, Quine endorses that the traditional borders among individual sciences and between philosophy and science should be blurred, but conversely, he never intends to defend the idea that they blur into a single mode of inquiry. Despite the integration or continuity between philosophy and science, there could still be some important methodological differences between philosophy and natural science, or between natural science and mathematics.[15]

A normative idea based upon a descriptive thesis

The Quinean CT is based upon the following descriptive thesis: starting at the middle, i.e., talking within our ongoing system. All thought, human and animal, scientific or not, arises from an inherited set of knowledge and its surrounding general framework. There is no cosmic exile, which would be a view from nowhere. This observation for Quine underlies his attack against the analytic and the synthetic distinction, his radical holism, and his thoroughgoing empiricism, which combined yield the distinctiveness of Quinean naturalism.

"Continuity" is the term we use for things that continue to happen or exist, with no great changes or interruptions. Thus, continuity does not mean sameness or the lack of change or of large variability; continuous change occurs without essential change. It is, however, primarily true of adjacent parts of the continuum and less true of distant parts. Continuity also implies a weak coherence; an uninterrupted connection or succession and a close union of parts.[16] In fact, it connotes the change of a special sort: the uniformity of change with no major shifts. Continuity and change are not mutually exclusive. Furthermore, several products of continuous change could be different or even

14 Quine, "Naturalism; Or, Living Within One's Means," 260.
15 Cf. Sander Verhaegh, *Working from Within: The Nature and Development of Quine's Naturalism* (New York: Oxford University Press, 2018), 91–93.
16 See also Willard Van Orman Quine, "The Way The World Is," in *Confessions of a Confirmed Extensionalist : And Other Essays*, ed. Dagfinn Føllesdal and Douglas B Quine (Cambridge, Mass.: Harvard University Press, 2008), 169.

opposite. The evolutionary tree is the best-known example of such changes. Minor changes in the DNA sequence could result in some remarkable ostensible differences among species. Applied to theory change, this explains how diachronic continuous change between succeeding theories may result, in the fullness of time, in unrecognizable outcomes. Conversely, at the points of contact we see more convergence.

This is probably true for synchronic continuums such as the Quinean continuum of science, common sense, and philosophy. The distant parts of this continuum are linked by a chain of intermediate steps, forming a relatively unbroken chain of local differentiation between adjacent units, like a chain of dialect resulting in dialect continuum. Regarding the historical chain linking philosophy, common sense and the rest of science, a considerable level of integration among them should be expected. To be sure, this integration may be weakening or becoming stronger at several points due to sundry reasons. Thus, perhaps we should talk about the disciplinary *continua* instead *continuum* in the case of science and philosophy. Continua may better capture the phenomenon of looseness in the joints of the web of science. Some disciplines are more transitional in that they have more mixed features from relatively distant disciplines.

The analogy with dialects could be confusing on the face of it. It might connote an exaggerated scale of integration within the continuum. However, even if we make the analogy not with dialects but with languages or even language families, we have the chance to examine the subdisciplinary fields. The result would be the same. Subdisciplinary fields are comparable to dialects, disciplines comparable to languages and, for example, physical sciences or life sciences are comparable to language families. This kind of transition between dialects or scientific disciplines results in a unificatory force, a dialect continuum. The parts in the web of belief combine to form a coherent picture. In this never-ending unification process, the elements involved may be similar or diverse. They may be deliberately shaped towards unification through prioritizing interdisciplinary research, such as we see in how funds are being allocated by the European Research Council or as a result of evolution. Nonetheless, unity is only possible if the deep structure of science allows for more than a mere tenacious coherence. Whether it allows a unity is a question remote from

observational checkpoints: "Naturalism itself is noncommittal on this question of unity of science. Naturalism just sees it as a question within science itself."[17]

For Quine, the business of the language of science is prediction. It does not mean that prediction is necessary, but it is sufficient. There are some disciplines whose capacity is limited to indirect prediction, and there are still more that function without even a tacit prediction. Economics and history belong to the former group of sciences.

So what is the place of philosophy in the web of science? Since in the Quinean theory, philosophy is continuous with the rest of science, the more accurate question would be: what is it to be distinctively philosophical? Here is Quine's answer: "The more general and speculative reaches of theory are what we look back on nowadays as distinctively philosophical." [18] Philosophical giants in history have been in search of an organized conception of reality. These searches were broader than contemporary special sciences and they used more basic concepts. This type of grand scale research was integral to the overall scientific enterprise: the search for an organized conception of reality. This is the continuity of philosophy with the rest of science. As is seen, for Quine CT is less about the similarities between philosophy and science or common sense, and more about the general nature of systematic (organized) human inquiry into reality.

The connections, historical or synchronous, between the predictive sciences and the non-predictive disciplines make them continuous. Economics, history and archeology, for example, symmetrize and simplify the overall design and become the major source of testable hypotheses and the growth of science.[19] These interactions at the borders of individual disciplines create an intensive exchange of questions, methods, and insights between the disciplines. For example, a behavioral or psychological science could borrow questions from philosophy, methods from neuroscience, and insights from clinical practice.

In parallel, cognitive neuroscience may study knowledge, mind, and meaning. It is possible and indeed is already underway, that these three can "be studied in the same empirical spirit that animates natural science," as Quine says[20] following Dewey. Science and the rest cannot be distinguished by the

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17 "Naturalism; Or, Living Within One's Means," 260.
18 "Has Philosophy Lost Contact with People," in *Theories and Things* (Cambridge, Mass.: Harvard University Press, 1981), 191.
19 Quine, "Naturalism; Or, Living Within One's Means," 256.
20 "Ontological Relativity," *Journal of Philosophy* 65, no. 7 (1968): 185.

subject matters but only by the organization; by the system,[21] or at least by being more systematic.[22] Let us now turn to discuss a natural and widespread objection against the continuity thesis which claims that the vast differences between philosophy, common sense, and science invalidate it.

Vast differences cannot invalidate the continuity thesis

The Quinean CT is one of the major sources of objections to Quine's naturalism. Philosophers who find Quine too radical offer alternatives to CT. The aim of these critics is to stay naturalistic but create room for an autonomous philosophy.[23] They assume that CT is incompatible with the existence of philosophy. The content, method and purpose are not the same in philosophy as in science. Their difference with Quine is obvious. For Quine, there are no solid borders between the subject matters of philosophy and science, although some topics might currently find a more natural home in either of these. Thus, the content is continuous between philosophy and science. The aim is an organized conception of reality for both philosophy and science: the continuum of the aims. Method is where the most relevant and striking differences might be found between philosophy and science.

I am sure that most philosophers and laypeople would think method is the thing that deeply differentiates science, at least contemporary science, from both recent philosophy and unregimented common sense. However, this is only true in a very concretized level of comparison, and that level should not be the focus of philosophical theorizing. The most appropriate level of comparison is linked to the nature of evidence. Evidence is intimately connected to observational sentences, which make philosophy, common sense and science

[21] Willard Van Orman Quine and J S Ullian, *The Web of Belief*, 2nd ed. (New York, N.Y: McGraw-Hill, 1978).
[22] Cf. Hoyningen-Huene, *Systematicity: The Nature of Science*.
[23] Akeel Bilgrami, "The Wider Significance of Naturalism. A Genealogical Essay," in *Naturalism and Normativity*, ed. Mario De Caro and David Macarthur (New York: Columbia University Press, 2010), 23–54; Mario De Caro and Alberto Voltolini, "Is Liberal Naturalism Possible?," in *Naturalism and Normativity*, ed. M. De Caro and D. Macarthur (New York: Columbia University Press, 2010), 69–86; Mario De Caro and David Macarthur, "Introduction: The Nature of Naturalism," in *Naturalism in Question*, ed. Mario De Caro and David Macarthur (Cambridge, MA: Harvard University Press, 2004), 1–17; Mario De Caro and David Macarthur, "Introduction: Science, Naturalism, and the Problem of Normativity," in *Naturalism and Normativity*, ed. Mario DeCaro and David Macarthur (New York, N.Y: Columbia University Press, 2010), 1–19.

continuous. It is what makes epistemology and logic, common sense and refined common sense, mathematics and empirical science, philosophy and science, and psychology and epistemology continuous.

The intelligibility of the notion of evidence lies in its archaic common-sense applications such as "clearly seen" as observation sentences are thought to be. Of course, as science develops, we have had more sophisticated ways to "see more clearly" and "reason more carefully." This is why scientific thinking is typically superior to the layperson's reasoning, and is also the reason why we have promoted science to the top of our ways of engaging with the surrounding environment. Nonetheless, science is nothing but refined common sense.

Quine's approach to the relations between philosophy, common sense and the rest of science is commonly claimed to be scientistic because it seems to scientize common sense, philosophy, art and social life.[24] By the word scientize we understand: to make philosophy or common sense systematic. The critics, however, perceive the word as stating our wish to apply scientific methods and principles to daily life and philosophy, which they think would result in the assimilation of the whole of life into a mechanical and cold science.[25] Let me now proceed to dispel this myth before concluding my paper.

Not assimilation but a struggle for freedom of movement

In Quinean naturalism we freely use whatever suits us to philosophize. It is sometimes sociology, experimental psychology, or history. Other times it may be evolutionary theory and linguistics. If it suited our purpose, we would even use the farthest flights of cosmology, pure mathematics, or quantum mechanics.

Am I allowed to use predictions, speculation, conceptual explication, common sense, sentence paraphrases, logical quantifications, gross abstractions of actual mechanistic processes, formulations in terms of a metaphoric extension of the technical vocabulary of the laboratory, thought experiments and raw feelings in my philosophical treatment of any topic? Indeed, I am.

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[24] Susan Haack, "The Two Faces of Quine's Naturalism," *Synthese* 94, no. 3 (1993): 335–56; Susan Haack, "Six Signs of Scientism," *Logos & Episteme* III, no. 1 (2012): 75–95, http://logos-and-episteme.proiectsbc.ro/sites/default/files/SIX SIGNS OF SCIENTISM.pdf.

[25] Hilary Putnam, "Science and Philosophy," in *Naturalism and Normativity*, ed. Mario DeCaro and David Macarthur (New York: Columbia University Press, 2010), 89–99.

Quinean naturalism is not in the business of indiscriminate thoroughgoing descriptions of the minutiae of the world. It is still abstract, normative, selective and general in a relevant sense. It is capable of commenting on value issues, primarily when the terminal parameter is expressed.

Epistemological problems are indeed partly normative, whereas scientific ones are primarily descriptive. For Quine, naturalized epistemology comes with the naturalization of normativity. [26] Epistemology will be incorporated into the empirical sciences rather than disappearing in favor of the sciences. At Quine's hand, naturalistic epistemology is one of the most normative schools of epistemology. For him, the best available scientific findings and ideas should be freely used in epistemology. It is a normative claim, both a limitation and liberation. Its emancipatory side is much more relevant today than the limiting side.

Conclusion

In this paper, I have tried to show that the Quinean CT has little to do with the amount of similarities between philosophy, common sense, and philosophy. At an abstract level, the nature of evidence, the aim of philosophy and science, the historical chains linking animal thinking, human common sense, philosophy and contemporary science, unify philosophy, common sense, and science. Conversely, at a much more concrete level, there are enormous differences in the methods, concepts, principles and aims of philosophy, common sense, and contemporary science.

CT has frequently been treated as a thesis concerning the similarities between philosophy, common sense, and science. Herein, I reject this treatment of Quine's thesis. I argue that the Quinean thesis never meant to deny the enormous differences between philosophy, common sense, and science; it conceives them as forming a continuum. The notion of continuum essentially involves the notion of change, albeit a specific one without huge shifts or unbridgeable gaps. Changes might be very big, even to the extent that occasionally we encounter some scientific theories that are utterly foreign to laypeople. The best-known contemporary examples are relativity theory and

[26] Willard Van Orman Quine, "Reply to Morton White," in *The Philosophy of Quine*, ed. Lewis Edwin Hahn and Paul Arthur Schilpp, 2nd ed. (Chicago and La Salle: Open Court, 1998), 663–65.

quantum mechanics. Even more alien theories will probably come up as the fundamental sciences advance. Even for these future theories, the evidence will have their end point in our senses, just as common sense gets its evidence from the senses. They will be aiming to have an organized conception of reality, just as our best current philosophy does.

It is likely that mathematics and logic will continue to play the role of conferring unity, at least to the predictive sciences, whether they be directly or indirectly predictive. These collectively are what make the continuum of philosophy, common sense, and science. The normative content of the Quinean CT concerns how to do philosophy. This continuity is only possible with holism, and holism is the thing that is supposed to destroy the epistemologically prime importance of the analytic and synthetic distinction. Since mathematics and logic imbibe their empirical content within their applications in the empirical sciences and their role in conferring unity to predictive science, there remains no philosophical problem with explaining the meaningfulness of mathematics and logic as they had no empirical content in the logical empiricists framework. Mathematics and logic are continuous with empirical science. They are not prior to empirical studies.

There is no "first philosophy," Archimedean point, or view from nowhere. All reasoning starts at the middle with our inherited mass of knowledge, principles, prejudices, biases, and underlying framework. Any philosophy pretending that it is exempt from this human predicate is under a fatal illusion. Their philosophical practice would make the same severe mistakes as logical empiricists when they tried to reduce ostensible objects to sense datum, even though sense data were posited as ostensible objects were.

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