

Neurath's Physicalism
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Introduction

The term 'physicalism' was coined by Otto Neurath in the early 1930s and was quickly adopted by other members of the Vienna Circle, including most prominently by Rudolph Carnap. Neurath was a socialist who believed that enterprises like science and industrial production should be organized according to the results of collective deliberation. Such deliberation, he thought, required a common physicalist language that would permit communication across disciplines and languages in ways that were accessible to everyone. Physicalism focused on universally shared features of human life; it was meant to provide a thing-language which was directed towards empirically observable events and objects. By talking in concrete, pragmatic terms about the problems of ordinary life, Neurath thought physicalism could provide the basis for the unified sciences and for inclusive collective deliberation about research priorities and the allocation of resources. Physicalism was Neurath's way of eliminating traditional philosophy, which he understood to pose barriers to communication and support to politically reactionary elements. In later decades, and contrary to Neurath's intention, 'physicalism' came to designate an ontological position whose principal features are familiar parts of contemporary philosophy. We now think of physicalism as some version of the claim that all real things are identical with or in some sense necessitated by the basic stuff that physics reveals to us. This was not what Neurath had in mind.

As an ontological position, late twentieth century physicalism came to serve a similar conceptual role in philosophical debates around the nature of mind, biology, and language that materialism held after the seventeenth century. In this familiar form, physicalism provided the basis of a broad consensus among analytic philosophers regarding the nature of reality. As Daniel Stoljar and others have argued, this physicalist consensus also helped to shape the conceptual tasks that analytic philosophers set themselves in the second half of the twentieth century. (Stoljar 2010, Symons 2010) Specifically, these tasks involved reconciling common sense understandings of life, mind, value, mathematics, etc. with what philosophers imagined the ontological findings of physics to be; philosophers puzzled over how to reconcile a world of atoms in the void with the technicolor world of ordinary experience, life, and value. Since this job falls outside of the purview of the physicist qua physicist, analytic philosophers were able to carve out a role within academic life that was independent of the natural sciences while at the same time maintaining a deferential and subordinate relationship to science. This relationship to socially and culturally dominant and high status scientific institutions served analytic philosophers well from the 1960s to the early 2000s. The project of reconciling science and common sense, grounded in physicalist ontological assumptions

allowed analytic philosophers to serve as Lockean underlaborers of the sciences, benefiting indirectly from the prestige of the sciences in the United States, while ensuring a role that could not be eliminated by the sciences. Perhaps this is one of the most important sociological reasons that physicalism was a core concept in analytic philosophy in the second half of the twentieth century. This institutional function of physicalism for analytic philosophers is completely different from the social and political vision that informed Neurath's physicalism.

A clear picture of the historical development of physicalism can help us to understand the development of that tradition; its motivations, its methodological commitments, and its shared assumptions. Contemporary physicalism typically involves substantive metaphysical claims - for example, the view that all facts are physical facts, that reality is ultimately physical, or that all phenomena can be explained in purely physical terms. Neurath rejected metaphysics. While Neurath's physicalism shared a concern with the central role of physics, his version of physicalism was rooted in a very different philosophical orientation - one that was resolutely anti-metaphysical, Marxist, and focused on the unification and testability of scientific knowledge, rather than on any commitments with respect to the ultimate nature of reality. This makes his version of physicalism distinct from many contemporary formulations while sharing some rhetorical and terminological features. It is also important to recognise that Neurath's vision of intellectual work was fundamentally different from the self-conception of academic philosophers in the second half of the twentieth century as we shall see.

To properly evaluate contemporary versions of physicalism, it helps to understand the historical sources of the idea. By understanding the relatively alien Viennese context in which the concept appeared we can more easily see which parts of contemporary physicalism we might wish to retain and which we might decide to reject. There are aspects of physicalism which can be distinguished and evaluated separately. Most obviously, Neurath did not intend for the notion of physicalism to play an ontological role and he certainly did not mean for 'physicalism' to serve as a stand-in for 'materialism'. Less obviously, the role of physicalism as a means of integrating the practice of science, its role in the service of something like a unity of science project, and the background political and social significance of physicalism, all need to be critically considered once we think about the history of the concept and what became of physicalism in later decades. Ultimately, Neurath's physicalism was a loosely characterized methodological principle aimed at facilitating interdisciplinary communication and unification; his physicalism played a social and political role in the collective project of inquiry, rather than serving as a metaphysical thesis about the nature of reality. His anti-metaphysical stance and his rejection of traditional philosophical debates stand in sharp contrast with today's physicalism. However, it is even more important to disentangle the various threads of physicalism's origins as part of Neurath's social and political ambitions and assumptions. Careful historical analysis allows for a more nuanced understanding of what physicalism could and should entail moving forward and allows us to distinguish the ideological commitments, social and institutional incentive structures, and genuine philosophical commitments of contemporary physicalism.

The obvious puzzling starting point for our reading of Neurath's physicalism is that he introduced the term in an intellectual context in which ontological and metaphysical arguments of the kind that occupied later physicalists and their opponents were anathema. For the Vienna Circle metaphysical debates were serious obstacles to the development of a progressive intellectual and cultural environment and were typically in the service of what they regarded as reactionary politics. Philosophy, in the traditional philosophical sense, was to be overcome and members of the Vienna Circle generally regarded traditional metaphysics, ontology, and theology as harmful vestiges of a pre-scientific era.

A second puzzling aspect of Neurath's physicalism is his view of materialism. Surely, a negative judgment of ontological theorizing should also include assertions about materialism (in fact, Carnap frequently pointed this out) but, as we shall see, Neurath continued to use 'materialism' and 'materialist' in his Marxist inspired polemics. Neurath's use of materialism in those contexts encourages contemporary readers to suspect that he was an unusually careless and inconsistent thinker. In order to make sense of this apparent contradiction in Neurath's thought, it helps to understand the interplay of his politics and his philosophical views. A generous reading of his apparent inconsistency can help shed light on the political function of his philosophical methodology. How we judge his larger political project is beyond the scope of this chapter, however, like many philosophers he subordinated his philosophical work to his socio-political ambitions.

Neurath's politics combine elements of technocratic optimism and Marxism. His version of physicalism is directly and explicitly ideologically inspired. Because of this, Neurath's approach to intellectual work looks very odd. In addition to being explicitly in the service of Marxist ideals, it differs from later analytic philosophy in that it appears to us as messy, polemical, and utopian. While Neurath does not fit the mold of a contemporary analytic philosopher, his view is reasonably internally coherent once it is understood as serving his political goals. He viewed scientific research as an integral component of a socially conscious and pragmatic approach to life. Driven by his commitment to collectivist social progress, he saw himself primarily as a practitioner of social engineering and reform. In this role he served as a gifted propagandist for the Vienna Circle, blurring the lines between science and politics and emphasizing practical concerns over precise theoretical distinctions (Cartwright et al 1996). Central to his thinking is the concept of *Ballungen*, by which he meant concepts or terms of ordinary language which resist sharp definitions and which admit of vague boundaries and relatively flexible applications (Uebel 1992) Thus, it should be no surprise that Neurath's physicalism itself can seem loosely defined and that his arguments are often relatively informal and perhaps even unconvincing. Furthermore, he often writes in the style of a manifesto rather than a philosophical argument emphasizing practical and even political considerations over theoretical precision.

The chapter explores Neurath's physicalism with a special focus on a series of five articles that he published between 1931 and 1941. Some of this early context is introduced and contrasted with its role in later analytic philosophy. While there is a dramatic transformation

in uses of the term, some aspects of Neurath's conception of physicalism are preserved in its modern form. The most significant similarity is the totemic role of physics within the unified sciences. In the thinking of the Vienna Circle and in the physicalists of the second half of the century, physics served as a stand-in for scientific rationality. Neurath explicitly identifies the broader unity of science movement with physics and connects both via the term 'physicalism' (1931, 621). Neurath's conception of physicalism is related to his conceptions of the unity of science, the place of physics in science, common sense, and his conception of the role of language in science. This aspect of Neurath's physicalism; the connection between scientific rationality and physics, may be the most important for understanding the role of physicalism in later analytic philosophy. Other aspects of his view, most notably its collectivist component, the emphasis on common sense and his emphasis on intertranslatability drop out almost entirely in anglophone analytic philosophy.

Understanding his perspective requires appreciating how radically different his political and pragmatic motivations were from those of post-war anglophone physicalists. The Vienna Circle advocated for a broadly scientific worldview (*wissenschaftliche Weltauffassung*). While this influence persisted among analytic philosophers in the second half of the century, their attitudes to metaphysics diverged dramatically from those of the Vienna Circle. The second half of the twentieth century saw a revival of interest in metaphysics and physicalism ended up as its dominant ontological doctrine. In this sense, later analytic philosophy combined a *wissenschaftliche Weltauffassung* with traditional metaphysics. From Neurath's perspective, this would have been an intolerable contradiction. Neurath's Physicalism was fundamentally opposed to metaphysics in ways that seem philosophically naive today until we understand his views in their proper political context.

What was Neurath's physicalism?

Neurath's physicalism was a methodological framework and a general approach to communication that was intended to provide a way of expressing meaningful empirical statements in the observational and logical terms used by the physical sciences. The core tenets of his view can be found in a series of five articles:

Physicalism: The Philosophy Of The Viennese Circle (1931)

Physicalism (1931)

Radical Physicalism And The 'Real World' (1934)

Physicalism And The Investigation Of Knowledge (1936)

Universal Jargon And Terminology (1941)

Elsewhere in his work, he discusses the relationship between physicalism and social science and discusses his Marxist understanding of materialism. We will take some of these other sources into account here, but the main focus of this reading will be these five articles. As we shall see, Neurath's physicalism did not rest on a metaphysical thesis about the nature of reality, but rather it was a general approach to the interdisciplinary unification, communication, and public understanding of scientific knowledge across diverse fields. His

goal with physicalism was to provide an anti-metaphysical framework for integrated empirical inquiry. He emphasized the goal of enabling broad participation in rational deliberations over socio-economic policies and transformations. The socio-political role of physicalism is key to understanding his view. Physicalism was, first and foremost, a political doctrine for Neurath. While this is not the way his advocacy of physicalism is usually understood, we usually read his use of the term through the lens of our own philosophical concerns. This has made the political background of Neurath's physicalism more difficult for us to appreciate. For Marxist thinkers like Robert Cohen, it was easy to see Neurath's physicalism as a public thing language that could serve as the heart of the project of collectivist unified science. His sympathetic account captures this idea:

[...] physicalism [...] shifted the logical empiricist theory from the 'private' phenomenalism of Carnap's first great re-constitution of the world as known to science and to everyday life over to a 'public' thing-language of communicable and usable technology and social relations; and Neurath stressed the pragmatic reality of common language throughout all responsible discourse, the practical reductionism of a physicalist language rather than any ontological reduction of entities or concepts. (1983, vii)

Cohen and others recognized that for Neurath, physicalism aimed at facilitating the unification and integration of empirical science. But this integration would not take place via ontological reduction or via a Carnapian project of re-constitution of the world from phenomenal experience. Instead, physicalism was an approach to the collective practice of science. As Neurath states: "Physicalism is the form work in unified science takes in our time." (1931, 56) Physicalism involved a particular way of conceiving and talking about the world in which practical concerns were at the foreground and deliberation with respect to inquiry was collectively undertaken rather than determined by experts or elites. The physicalist language was to provide the medium for this collective deliberation. Neurath hoped that this physicalist language could emerge out of prevailing everyday language and be simple enough that it could be easily learned by children (1931, 64).

One reason for his anti-metaphysical position was his belief that metaphysics and traditional philosophy were an impediment to communication. Insofar as they created barriers to collective deliberation they were to be avoided. In order to facilitate communication, Neurath argued for what Cohen correctly identified as a "'public' thing-language of communicable and usable technology and social relations" (1983, vii). Central to Neurath's physicalism was the idea that all meaningful statements must be empirically grounded in spatio-temporal terms drawing only on commonsense observational concepts: "Unified science based on physicalism recognizes only statements with spatio-temporal data. 'Equivalent statements' are constructed physicalistically; for statements are physicalist structures, written or spoken words." (1931, 55) He thought of physicalism as aligned with logical empiricism and regarded that philosophical orientation to be the basis for shared engagement with the world: "For physicalism as it is represented here quite strictly, everything that was put forward as philosophy by scholastics, Kantians, phenomenologists, is

meaningless except that part of their formulations that can be translated into scientific, that is physicalist, statements." (1931, 57) For Neurath, physicalism was to be a common "universal jargon" facilitating interdisciplinary communication and empirical analysis across the sciences: "I have tried to discover in agreement with my scientific friends what expressions might form the elements of a set of terms which could serve to create such a worldwide contact. This implies that one presents a set of empiricist expressions together with the rules for their application and asks for a convention concerning scientific communication."(1946, 500) Crucially, Neurath saw his physicalist project as socially and politically transformative, empowering mass public participation in collective deliberation over economic planning and policy. The goal was an intersubjective framework to facilitate interdisciplinary integration, public understanding, and applied socio-economic analysis towards realizing a more rationally structured, egalitarian society. Physicalism was as much Neurath's vehicle for democratizing science and enabling mass participation in collective decision-making as it was a philosophical program unifying empirical knowledge representation and reasoning across domains. Its anti-metaphysical bent served an overarching set of political goals.

My suggestion seemed to have the advantage that the "when, where and how" attitude could be maintained from the bottom to the top. This I call the 'physicalist' approach, which has nothing to do with 'mechanism' or anything like that; it only pretends that we can use the everyday language which we use when we talk of cows and calves throughout our empiricist discussions. This was for me the main element of 'unity.' [...] I myself stressed that we can start from everyday language after dropping some expressions, derived from magical, theological, or metaphysical speculations. My thesis is that this start is common to human beings, past and present, all over the world. We are not presenting them with some new unity; not at all, we only want to say that wherever people speak to one another, for example, marooned men on an island coming from different parts of the world about fishes and trees, drink and sleep, pain and pleasure, they will have no particular difficulties in communicating through gestures, pictures, and words, which they may translate from one language into another. Difficulties will usually appear when they want to tell each other of their different magical expressions, theological sentences, or metaphysical formulations; whereas, and this is our point, in putting forward the principles of the relativity theory we may start from the bulk of everyday sentences that all these people have in common. This agrees with a saying by Gregorius Itelson: 'What one cannot explain in principle to a taxidriver in his language must be somewhat twisted.' (1946, 499-500)

In this passage, we see how radically different Neurath's physicalism is from its more recent form. It is grounded in a political vision that is universalist and optimistic. It has "nothing to do with 'mechanism' or anything like that" but is committed to the idea of communicability and the thought that apparently abstract and difficult scientific results can be presented in ways that are universally comprehensible. Neurath's philosophical anthropology is democratic and anti-elitist in spirit and this underlies his view of the physicalistic language and approach to inquiry. In the following section we will unpack his political commitments in more detail.

Physicalism in an Austro-Marxist context

Neurath's optimistic and democratic view of human cognitive capacity, showed up throughout his tangled blend of Austro-Marxist political aspiration, internationalism, and scientism. This ideological melange shaped his conception of physicalism. As we have seen, he viewed traditional philosophy; "magical expressions, theological sentences, or metaphysical formulations" as an obstacle to practical progressive social transformation by diverting attention from concrete socio-economic conditions. We will see how this view influences his understanding of the virtues of physics in a later section of this chapter.

From a contemporary perspective, we can see that Marxism itself is not free from metaphysics. Most obviously, Marx is centrally committed to dialectical materialism; the Hegelian view that all phenomena result from the movement of contradictions and the dynamic interplay of opposing principles. Marx viewed reality and existence itself as an ongoing dialectical process. However, as we shall see in our discussion of Neurath's use of the term 'materialism' below, he interpreted Marx's metaphysical assumptions about the nature of being and change as grounded in empirically derived observations of social reality rather than seeing them as metaphysically loaded speculation derived from Hegelian idealism. In fact, Neurath thought that his anti-metaphysical physicalism was not only compatible with his Marxist commitments but also that physicalism was deeply intertwined with his belief that the collective action of the unified sciences was key to progressive societal transformation. Where his Marxist politics and his anti metaphysical posture seems most conceptually confused is in his discussion of materialism.

Neurath's Marxist commitments are difficult for us to treat sympathetically in light of the dark history of Communist regimes. In addition to the catastrophic record in government, Marxists are typically committed to a hopeless blend of obsolete economic theory and muddled Hegelian metaphysics. However, it is important to recognize that the internationalist, universalist, and broadly socialist ideals of the Vienna Circle emerge in the context of resistance to anti-modernist appeals to blood and soil nationalism in the German speaking world of the 1920s and 30s. Neurath and the other members of the Vienna Circle were also strongly opposed to religion and traditionalist identitarianism of all kinds for similar reasons. Neurath's Marxism was motivated by modernist and internationalist sentiments and his physicalism was intended to support these political aspirations. This should be clearer once we examine his conception of materialism in a later section.

Neurath was convinced that centrally planned economies could successfully improve the lives of the poor, and he was inspired by the mass mobilization of European societies during the First World War to believe that technocratic central planning was feasible and could be harnessed in politically enlightened ways. He had hoped that this planning process could take

place collectively. It was to extend beyond top-down planning by elites or experts; for Neurath, this planning was to be undertaken with the active participation and decision-making involvement of workers themselves. In his ideal state, there would be collective deliberation and decision-making governing economic activity, including decisions concerning the distribution of resources required for scientific inquiry. Via physicalism, collectivism would be in effect in the sciences and decisions with respect to the allocation of resources and the determination of research priorities would be the result of democratic deliberation. As Reisch (1997) and others have noted, this notion of collectivism in scientific research was the organizing principle that underlies Neurath's conception of the unity of science program. Physicalism, with its emphasis on interdisciplinary integration and the elimination of metaphysical barriers, was to be the central plank of that project of unification, aligning with Neurath's progressive political vision of a rationally planned society governed by scientific principles and mass participation.

In Neurath's life and work, his ideological commitments were manifested in practical ways. He participated in government and helped to develop tools and techniques that he believed could ameliorate the lives of workers. An example of the former is his activity during the short-lived Bavarian Socialist Republic in 1919 where he led the Central Planning Office which was established to manage economic activity in Bavaria. An example of the development of tools and techniques was his work in the development of Isotype (the International System of Typographic Picture Education). Isotype was meant to be a system of visual representations that could convey statistical information and other kinds of useful information to working class audiences in memorable and straightforward ways (CITE). Physicalism was intended by Neurath to play a similar role to Isotype in philosophy and science.

Attention to Neurath's version of physicalism provides a fascinating example of the interplay of politics and philosophy. Understanding his views illuminates the transformation in the role played by the notion of physicalism in later decades. The social and political mission that guided the Vienna Circle and the utopian socialist ideals that Neurath embraced faded quickly after the Second World War. As centrally planned economies and Marxist ideology became a significantly less attractive option for analytic philosophers the doctrine of physicalism took on a new character among academic philosophers as we will in more detail below. Post-war Anglophone philosophy was strongest in the United States where its practitioners led lives broadly in conformity to the politics of their society. In place of utopian collectivist socialism the political lives of Anglosphere academics typically blended a form of progressive liberalism with bourgeois expressivism.

This contrast is relevant here with respect to the role of expertise in collective decision making with respect to inquiry. While contemporary analytic philosophy typically places a premium on expertise and epistemic authority and adopts a deferential relationship to the authority of the natural sciences, Neurath's conception of physicalism was driven by the goal of democratizing both scientific knowledge and public policy decision-making processes. His physicalist program needs to be understood within the broader context of this set of political

ideals and his advocacy for collective decision making in an egalitarian and participatory society. Rather than concentrating knowledge production solely in the hands of elite experts, Neurath believed that physicalism could form the basis of a conceptual and linguistic framework that could allow greater integration and communication of scientific insights across disciplines and domains. By expressing research in a common, accessible language anchored in empirical observation, common sense terms, and logical rigor, physicalism could serve to break down barriers and make scientific understanding more widely available. Moreover, Neurath saw physicalism as a means to ground collective deliberations about economic planning and social policies in an empirically-grounded, rationally guided framework. His emphasis on intersubjective verification aligned with democratic principles of public discourse and accountability.

Neurath's specific proposals were motivated by an egalitarian ethos - a desire to empower workers, citizens, and the broader public with the ability to understand and participate in shaping the scientific knowledge and decision-making that affected their lives and to decide on the allocation of the resources required for inquiry. Notice that this is directly contrary to a view that would have epistemic authorities determine the direction of inquiry. Again, as previously mentioned, his anti-metaphysical stance and advocacy for a unified scientific worldview were part of a project to realize progressive social ideals.

Neurath's Physics

For the members of the Vienna Circle, physics served as a model for clear thinking and scientific rationality. They understood it to epitomize the empiricist, anti-metaphysical philosophy they espoused and aspired to replicate across all domains of inquiry. In essence, physics represented the archetype of an intellectually and empirically virtuous science - one characterized by empirical groundedness, logical rigor, universality, objectivity, progressiveness and methodological sophistication. It became their paradigm for what a fully-fledged, reconstructed science ought to be. Its reliance on observation, experimentation, and mathematical formulation provided a model for how scientific results ought to be acquired and verified. While there were disagreements among members of the Vienna Circle over the verification principle, they typically endorsed the view that meaningful statements must be either empirically verifiable or analytically true. Physics was thought to provide a clear example of how this principle could be applied in formulating verifiable empirical claims devoid of ungrounded metaphysical content.

By contrast, most contemporary philosophers take 'physicalism' to refer to something like the view that physics provides our best account of being at its most fundamental level. Versions of this position have figured prominently in analytic philosophy during the second half of the 20th century. While physicalism encompasses a range of views and has taken various forms (Dowell, 2006) it came to serve as a kind of background commonsense consensus among academic philosophers in the anglophone world. The guiding assumption was that if one wants to understand what reality is like, one's best bet is to simply follow the results of physics. According to physicalists, the latest best physics should provide us with

our ontology and one of our most important tasks as philosophers is to reconcile ordinary folk talk of tables, animals, numbers, feelings, and values, with what an idealized physics reveals to us as really real. In this spirit, analytic philosophers tended (with some notable exceptions) to outsource the difficult task of answering the question of what there is to the physics department. Understood in this way, physicalism is an ontological position insofar as it seems to offer a criterion for distinguishing reality from unreality: if something is real, it is ultimately determined by, or is identical with the fundamental physical components of the universe.

Critics have pointed to the challenge of precisely defining what 'physical' entails and what is meant by fundamentality in this context, but physicalists have generally been content to live with these loose ends in exchange for what they see as the virtues of the view (Stoljar, 2010). Despite its diversity, physicalists in the analytic tradition from the late 1950s, came to share core commitments regarding metaphysical fundamentality. Broadly, these commitments include the belief that the physical world is causally closed, that individuation entails unique causal powers, and a commitment to Hume's dictum regarding individuation (Kim, 1999). This metaphysical commitment was sometimes accompanied by a rhetorical rejection of traditional philosophical reflection on metaphysical questions - for example, Quine's quip that "philosophy of science is philosophy enough" (1953, 446). That anti-metaphysical point is very different from Neurath's position. For later physicalists, Quine's "enough" is a metaphysical completeness claim rather than a Neurathian comment about the purpose of philosophical inquiry. In order to see how completeness works for later physicalists it will be important to briefly examine Hume's dictum. This is the assumption that "there are no metaphysically necessary connections between distinct, intrinsically typed, entities." It implies, as Jessica Wilson notes, that if such connections exist, then the entities are not distinct (Wilson 2010). This cluster of commitments raises many questions for physicalists: for example, how can they ensure that *no* properties or entities are distinct from the physical realm? In trying to avoid the existence of properties separate from the physical, how can physicalists avoid latching on to an unrealistic conception of the fundamental physical level? Philosophers have rarely provided robust arguments for the completeness claim, which asserts that a metaphysical system captures all truths expressible within its language (Symons 2015; 2018). Ensuring formal completeness requires demonstrating that every physical fact can be derived from initial conditions and the laws of physics. However, achieving this without resorting to an ontology including mathematical entities, as Quine observed, seems improbable (Quine, 1981).

While the formal completeness of a system concerns the ability to derive all the truths that can be formulated within that system's language, metaphysical completeness extends further. So, for example, if a physical system were formally complete, it would mean that all the physical facts could be derived from within the language of the physical system given some set of basic laws and the fundamental ontology of that system. An ideal physical theory would exhaust all that there is to say about the physical world. Metaphysical completeness is different. It requires not only capturing all physical facts but also ensuring the adequacy of the system's language, so that nothing is overlooked or excluded. So for a formally complete

physicalistic ontology, demanding metaphysical completeness means insisting that there is nothing else to be accounted for other than the physical facts. This is where physicalism faces its toughest challenge, especially in explaining phenomena like qualitative experiences or mathematical entities in terms of physicalist ontology. Merely claiming that physicalist principles cover all physical facts isn't enough; one must also justify the exclusion of non-physical facts—those not identical to or determined by physical facts.

It is important to recognize that Neurath did not look to physics for a fundamental ontology let alone a complete ontology. Neurath understood physics as a form of scientific rationality that was in direct opposition to traditional philosophy and theology (Sebestik 2010). Perhaps most importantly for Neurath physics, he believed, simply ignores the history of philosophical and theological disputes and focuses on the practical challenge of advancing their research in the present. The scientific worldview he advocated was one modeled on what he saw as the physicists' lack of interest in philosophical and theological questions:

The advocates of a scientific world-conception, which absorbs everything that can be experienced, behave like physicists. They are active and close to the present time even if they move in abstract spheres. They care less for the history of their trains of thought than for new insights, which they try to formulate in clear statements. They do not rest satisfied with the results achieved, but advance and improve formulations year by year. (1984,33)

In practice, the kind of research in physics that impressed Neurath was characterized by a willingness to drop existing ways of understanding problems in order to creatively reframe their tasks. He was impressed in particular, for example, by the elimination of reference to absolute space in the thinking of Einstein and Mach. Neurath admired what he regarded as the elimination of the kinds of metaphysical excesses that he understood to be intellectually dishonest and politically regressive. He writes, for instance, that “[t]he Mach-Einstein conception dispenses with this "absolute space" which assumes any meaning only when one conceives of God who is present in all places at all times. Absolute space is a product, in a sense, of a "sensorium of God" (Newton). In the Mach-Einstein theory we find only bodies and their relationships” (1931, 621). Neurath praised the physics of his time for having been “successfully purged of metaphysical formulas” (1931, 620) and as thereby providing a model for what a stripped down non-metaphysical mode of communication would be. This stripped down language was understood, at its core, to be built solely on spatio-temporal relationships.

With physicalism Neurath was aiming for both a minimal language and an organizing ideological perspective that would serve the project of the unified sciences and thereby the larger social and political project of socialism. This minimal kind of language would capture only scientifically expressible content that could be readily shared across disciplines in ways that would also transcend cultural and linguistic differences: “What is at all scientifically expressible is no richer in fundamental relations than the symbols on a Morse tape which the telegrapher reads as they are sounded by his apparatus. In a sense unified science is physics

in its largest aspect, a tissue of laws expressing space-time linkages - let us call it: *Physicalism.*” (1931, 620)

Physicalism served as both a unifying language and a means of unified collective organization of the scientific project. At this point it is worth briefly touching on some of the differences between Neurath and Carnap’s views of physicalism as a unifying language. Carnap saw the physicalistic language as an ideal linguistic framework that all scientific claims should be translatable into or reconstructed within. This physicalistic language would be based on the well-confirmed laws and observational terms of advanced physics. It would be a universal epistemologically primitive language permitting intersubjectivity, testability and the empirical grounding of all scientific knowledge. Neurath, by contrast, was anti-foundationalist about the physicalistic language. He didn't see it as a metaphysically privileged language of nature. For Neurath, the physicalistic language was primarily a tool for facilitating communication, connections and unified common action across the various sciences. He didn't insist all sciences be reconstructed in one universal language, but rather advocated translating between sciences to make them mutually intelligible. So for example, he differed from Carnap with respect to the need to reduce, for example, the laws of social sciences to the laws of physics.: “The development of physicalist sociology does not mean the transfer of the laws of physics to living things and their groups as some have thought possible” (1931 75). Social sciences could continue their work discovering lawlike aspects of society without being unduly concerned with the need to reduce those phenomena to physics. Physicalist language for Neurath was intended to make interdisciplinary communication possible rather than an effort to ground scientific knowledge in an assumed bedrock physical reality. While both sought unified science via a physicalistic language, Carnap had foundationalist ambition, while Neurath took a more pragmatic, pluralistic and anti-metaphysical stance on the role of such a language.

Neurath looked to physics as providing a model for stripping away metaphysical excesses like the notion of absolute space and time, which he saw as intellectual dishonesty linked to theological assumptions. Rather than being captured by the history of philosophy and theology, physicists were concerned with practical problems and concrete solutions. His conception of physicalism aimed to capture this non-metaphysical, empirically grounded mode of inquiry focused solely on observable spatio-temporal relations between intersubjectively shared objects. While he shared Carnap's goal of a unified scientific language, Neurath rejected Carnap's foundationalist ambitions, instead pragmatically envisioning physicalism as a flexible tool for fostering mutual intelligibility across domains without requiring reductive unification. Crucially, this anti-metaphysical, non-reductive physicalism was deeply intertwined with Neurath's progressive sociopolitical vision of mass participation in collective deliberations over scientific knowledge and policies.

Neurath’s materialism

While Neurath rejected metaphysics and ontological commitments in his conception of physicalism, his continued use of the term 'materialism' may seem inconsistent with this anti-

metaphysical stance. However, it is important to understand that when Neurath invoked 'materialism', he was typically drawing on its meaning within the Marxist tradition as he understood it rather than employing it as a robust metaphysical doctrine. For Neurath, 'materialism' stood in opposition to idealistic and spiritual elements that he associated with bourgeois thought. Despite Carnap's arguments that materialism was itself a metaphysical position akin to idealism, Neurath continued using the term 'materialism' in more propagandistic, politicized contexts. Yet as we shall see, his use of 'materialism' in this Marxist and apparently metaphysical sense is orthogonal to physicalism's role as the central anti-metaphysical plank in Neurath's larger vision of unified science organized around the socio-political goals of international socialism. Arguably, Neurath himself understood his Marxism to be evaluable in terms of scientific principles and as a part of the project of overcoming metaphysics (Sander 2005). His endorsement of Marxism is partly due, as we shall see to his belief that Marx as a thinker was guided by empirical observation of social realities and he criticizes readers of Marx who he believes interpret him in an excessively metaphysical manner. It is striking for example, that he rejects what he calls metaphysical Marxism in his review of Karl Mannheim's, *Ideologie und Utopie* (1930) (2020). His criticism of Mannheim highlights the difference between what he sees as the ambitions of metaphysics and those he identifies with Marxism:

Yes, at the end of the day here lies the major contrast: Mannheim seeks the all-encompassing view, an angle on the whole "world"; that is to say, metaphysics! Marxism, in contrast, seeks to make accurate statements concerning social processes! It wants to predict the future fate of the proletariat and other classes! Metaphysics versus science! In the end, and despite all his kindness, Mannheim versus Marxism: the bourgeois front versus the proletarian front! It's the old familiar tune! (2020)

Furthermore, Neurath understood Marxism to be subordinated to scientificity.

Nationalism, religiosity, but also Marxism itself are for Marxists ideologies of particular times and life-orders; particular classes and groups. (pp. 148-149) (...) Through the application of its own method to itself, Marxism (...) announces to the proletarian front that it has become the bearer of scientificity. (...) For the proletarian front, tactics of struggle and propaganda interests coincide with respect for science and overcoming metaphysics [Neurath's emphasis]." (p. 151)

In this critique of Mannheim, Neurath draws a sharp contrast between what he sees as the valid, scientific elements of Marxism focused on analyzing social processes and predicting class dynamics, versus the "metaphysical" tendencies of seeking an all-encompassing, totalistic worldview. He accuses Mannheim of falling into metaphysical thinking by aiming for a comprehensive philosophical perspective on the whole of reality. In contrast, Neurath argues that authentic Marxism "seeks to make accurate statements concerning social processes!" - a distinctly empirical, scientific endeavor.

This passage underscores Neurath's commitment to subordinating Marxism itself to principles of empirical scientificity and overcoming metaphysical speculation. While he continued using Marxist concepts like "materialism" for their political resonance and for its emphasis on the priority of material conditions over ideological considerations, Neurath was deeply wary of allowing Marxism to veer into metaphysics: "Metaphysics versus science! In the end...Mannheim versus Marxism: the bourgeois front versus the proletarian front!" For Neurath, this tension between science and metaphysics is directly linked to broader class struggles. Neurath also understood Marxism to be capable of eliminating its own potential metaphysical excesses by applying its own method to itself; for Marxists, even "Marxism itself" should be treated as a historically-contingent "ideology" rather than an eternal truth. By "applying its own method to itself", Marxism can overcome these metaphysical tendencies and align itself as "the bearer of scientificity" committed to "overcoming metaphysics."

So while appropriating the rhetoric of "materialism" for political purposes, Neurath believed that Marxism itself be subjected to rigorous scientific standards that reject all-encompassing metaphysical worldviews in favor of empirically-grounded analysis. His physicalism and opposition to metaphysics took precedence over any quasi-metaphysical strains within Marxist thought. In the following passage we find Neurath connecting the democratic ideal of collective decision making with his political criticism of metaphysics for confusing the proletariat about who their friends and enemies really are:

There is, for Marxism, no higher "duty," nothing that is beyond the human. The joint decision determines everything. Workers, employees, and peasants who have understood this will no longer be attached to their class enemy through patriotism, nationalism, religion, folk commonality [Volksgesamtheit], and the like. If they find it desirable to support their national customs, their national language, then this is a decision that need not necessarily have anything to do with the cooperation between proletariat and bourgeoisie, as we can clearly see in the nation states of Russia where people, on the basis of proletarian rule, extend national education systems. That is quite possible without metaphysics, whereas ideology adverse to class struggle requires metaphysics. This is why on the bourgeois side a unified scientific education is not possible. The scientific stance must be intermittently interrupted by national, religious, and patriotic propaganda! The student who studies technology in the morning, is, by the evening, attending seminars on the categories of being, disembodiment, political economy, and proof of the existence of God. They stand facing each other: the bourgeois front — which, due to sociological conditions, is necessarily conflicted: half scientific, half unscientific — and the proletarian front, whose fundamental orientation is scientific through and through! (2020, 238)

This passage provides valuable insight into how Neurath conceived of the relationship between physicalism, scientific education, and his Marxist political vision. He emphasizes the primacy of collective decision-making and rejects any notion of higher metaphysical duties or

truths beyond what is jointly decided upon by the "workers, employees, and peasants". This anti-metaphysical stance aligns with physicalism's emphasis on intersubjective, empirically-grounded agreements.

Neurath saw nationalist, religious, and similar ideologies as inherently metaphysical constructs that divide the working class by attaching them to "class enemies." Physicalism, by stripping away such metaphysics, can unite the proletariat via a genuinely scientific education. By contrast, the bourgeoisie was necessarily conflicted between scientific and metaphysical modes of thinking. As he saw it, the "proletarian front" can maintain a unified, wholly "scientific stance" by embracing physicalism and rejecting metaphysical distractions. Ultimately, physicalism plays an emancipatory role by facilitating a proletarian-led "scientific education" system unburdened by metaphysical ideology and divisions sown by the bourgeoisie.

So for Neurath, physicalism is not merely a philosophical program, but a vital political tool to unify the proletariat around a coherently scientific worldview that rejects metaphysical distractions impeding progressive social transformation. Its anti-metaphysical tenets allow physicalism to serve as the linguistic/conceptual foundation for a proletarian-led educational project promoting scientific reasoning in support of collectivist goals.

Conclusion

Neurath's conception of physicalism stands apart from later analytic formulations in its radical anti-metaphysical stance coupled with an explicit socio-political agenda. For Neurath, physicalism was a key component of a broader emancipatory project aimed at democratizing science and empowering mass participation in collective decision-making over economic policies and the direction of inquiry itself.

Neurath envisioned physicalism providing the common language and conceptual framework to integrate the sciences into a unified enterprise oriented towards improving the material conditions of the working class. By stripping away metaphysical abstractions and presenting research in intersubjectively accessible, empirically-grounded terms, the physicalist approach could facilitate communication across disciplines and make scientific knowledge widely available for public deliberation.

This democratizing function of physicalism was central to Neurath's utopian vision of rational, technocratic planning undertaken not by elite experts alone, but through the active involvement of workers and citizens. His calls for a "universal jargon" rooted in everyday language reflected an egalitarian belief in a human capacity to engage substantively with science when freed from obfuscating metaphysics. Neurath's anti-metaphysical physicalism was entwined with his Marxist leanings and advocacy for international socialism. In this sense, Neurath's physicalism embodied the modernist, scientific ethos of the Vienna Circle, but pushed further than his colleagues towards overtly emancipatory political ends aligned with the socialist movements of his era. His repudiation of metaphysics was as much a

repudiation of the era's rising ethno-nationalist identitarianism as it was of the philosophical tradition.

From our contemporary vantage point, both Neurath's Marxist politics, his faith in technocratic governance, and his particular philosophy of science can seem dated, even naive. His dream of a globally unified "physicalist" science democratically stewarded by a scientifically informed international proletariat never materialized. His physicalism is characterized by features discarded in its later anglo-analytic articulations - its anti-elitism, its universalist aspirations to public intelligibility, its aim towards "unified common action" rather than fixed foundations. While many contemporary naturalists and pragmatists continue to reject metaphysics, few retain Neurath's orientation towards collective decision making in science.

So while Neurath's specific program proved untenable, recovering the democratic impulses underlying his physicalism can illuminate current debates. Neurath's physicalism was a political project- one actively opposing metaphysical mystification in hopes of realizing a more egalitarian, scientifically-guided future.

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