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Einstein vs. Bergson, Scientism vs. Humanism

Abstract

This paper argues that interpretations of scientific theories should be as attentive and faithful as possible to everyday language and experience. Scientific theories do not choose their own interpretation, they do not favor, or give credence, to one interpretation over its rivals. Rather, the strength and viability of an interpretation are determined by the degree to which it is attuned to irremovable aspects of everyday language and experience. This is true in particular of Special Relativity. Thus, nothing in Special Relativity vindicates the claim that passage is an illusion, or supports eternalism. The suggestion that Relativity does establish the truth of eternalism derives from metaphysical, rather than scientific grounds, grounds that are not suggested or supported by the theory itself. This is illustrated in Putnam's famous 1967 paper, the conclusions of which imply a frontal collision between physics and experienced time. It is this concern that prompted Stein to object to Putnam. I claim, however, that Stein's alternative ends up collapsing to a picture very similar to Putnam's. Following this analysis, the paper turns to discuss the distinction between Humanism and Scientism. Put crudely, while scientism identifies what can be known with what can be known scientifically, Humanism allows the field of empirical research to include, in addition to the testimony of the senses, our emotive stance vis-à-vis what we see, our sentimental reaction to what we experience, and to take into account the salient and constitutional normative aspects of many of our dealings and interactions with our environment. The result is an empiricism that offers a richer, fuller, profounder understanding of reality than that which is limited only to science. I argue that the choice between Humanism and Scientism is strictly philosophical, and not scientific. Finally, it is stated that Humanism is more faithful to the science, its methods and empirical spirit, and that scientism, in contrast, serves disturbing, and currently quite vocal, anti-scientific sentiments.

1 Dilation vs. Passage, Interpretation vs. Theory

It is uncontroversial that time is frame dependent —time dilation is a fact. But in conjunction with time-dilation it is often contended that time's passage is merely

psychological. And this latter claim is controversial. Why the difference? It is widely held that both are results of Special Relativity (hitherto SR). Nevertheless, dilation is not a subject for philosophical inquiry and debate while passage very much is. One dissimilarity that immediately strikes the eye is this: dilation is empirically testable, measurable; the unreality of passage is not. Whether time's passage is an illusion or a feature of objective reality is not a question regarding which any observation or experiment could be relevant. Which is not to say that debates regarding passage are not about facts, or about the fundamental structure of reality, they very much are, just that the opposing claims figuring in the dispute are not testable in the manner that dilation is. How then are they evaluated? The reason why no experiment or observation can advance the issue of passage is that any outcome of an experiment and any observation will be *interpreted* by the disputants in accordance with their view. Indeed, the teachings of SR regarding passage come out of interpretations of the theory. So, the question is how to assess the strength of an interpretation.

I will argue (unpopularly, I'm afraid), that an interpretation's worthiness is determined, not only but importantly also by the *sensitivity of the interpretation to everyday language and experience*. However, everyday language and experience have fallen to disrepute over the last decades. This, I maintain, is lamentable. First, contrary to a myth that has gained momentum in the course of the 20th century, everyday language and experience are not in conflict with science (more on this below). Second, in truth, no interpretation of a scientific theory can ignore them, and I hope to show that those interpreters that turn to everyday language and experience deliberately and unabashedly have an advantage over those that were caught in the tide of hostility to everyday language and experience that swept large areas of the philosophical scene in the second half of the 20th century and continues to dominate much of philosophy today.

But let us start with a preliminary question: why is an interpretation of SR needed in the first place? Aren't scientific theories self-explanatory? In the most obvious and straightforward sense an interpretation is needed because the mathematical symbols used in a theory can denote various entities and so their meanings must be fixed for the theory to be a theory of so-and-so. Somewhat schematically we can envision one and the same mathematical framework that, under one interpretation of its symbols, describes the dynamics of a certain economy and under a different interpretation describes the migration patterns of birds.¹ But ascribing a reference to the mathematical symbols of a theory is just

1 That the theory is not identical to its mathematics is also made evident by the math-free ren-

the first level of interpretation. The philosophically more challenging stage pertains, not to which concepts the mathematical symbols represent, but to how to understand these concepts. That's where the heated interpretative controversies regarding Relativity (and no less so Quantum Mechanics) take place. Disputants can accept the formal framework, e.g., the Lorentz transformations and the mathematical reasoning leading to their formulation, and yet sharply disagree about what the transformations say, or about their implications, e.g., as to whether they do or do not entail the illusoriness of passage.

It is important to stress that also on this more advanced level of interpretation, theories do not provide their own interpretation and do not point to a correct one. Where there is more than one possible interpretation of a theory, the mathematical framework together with the basic understanding of the meaning of the mathematical symbols do not establish which interpretation is true, and not even which is superior —were that the case the dispute would have been over before it began and the theory itself would in fact be telling us all there is to learn from it. An interpretation of a theory must go beyond what the theory itself says and to stick its neck out without enjoying the backing or confirmation of the theory. I emphasize this because I will be claiming that those who present their stance regarding passage as a logical consequence of SR or as corroborated by the theory are misguided on this point and misleading their readers.

2 NPO vs. GPR

It is somewhat telling that it took more than 50 years from the publication of SR until papers offering rigorous Relativity-based 'proofs'² that time's passage is not part of physical reality were published. If the unreality of passage was a straightforward consequence of Relativity either such arguments would not be necessary at all or they would appear more or less at the same time as the theory itself. But what Relativity says about time is far from straightforward, and it took decades for the conceptual complexity of the issues to become appreciated. The first articulations of systematic arguments were Rietdijk's (1966) and Putnam's (1967). We shall focus on Putnam's argument, and specifically, on the key component of his argument, the *There Are No Privileged Observers* premise —henceforth NPO. Here it is:

ditions of it, as in Einstein's *Relativity, the Special and General Theory* and Feynmann's *QED*, to mention two examples.

² In contrast with mere declarations, such as Einstein's, that passage is merely an illusion or that the time of the philosophers does not exist.

If it is the case that all and only the things that stand in a certain relation R to me-now are real, and you-now are also real, then it is also the case that all and only the things that stand in the relation R to you-now are real (Putnam 1967, 241).

A few comments are in order regarding this premise.

(1) The title *There Are No Privileged Observers* (NPO) echoes one of the two fundamental premises underpinning Relativity theory (and indeed all of physics), namely, the Galilean Principle of Relativity (GPR). According to this principle the laws of nature are independent of the location or motion of the scientist investigating them. In the language of Relativity this means the invariance of the laws of nature under change of frame of reference (of inertial motion in SR and also of acceleration for GR). Or, to put it differently, the principle states that there are no privileged observers —there is no special location or state of motion which affords unique access to the correct form of the laws of nature.³ This last formulation underscores the supposed affinity between the two principles. The NPO could actually be read as an obvious corollary of the GPR, an addition which should be embraced just as readily as the highly valuable original. The two, however, are categorically different (as is elaborated below). The one is a crucial methodological principle which was instrumental in physics' most fundamental discoveries,⁴ the other is a metaphysically contentious position. NPO is a paradigmatic example of a metaphysical opinion, used in interpreting a scientific theory that, as I will claim, with no good reason comes to be viewed as emerging from the theory it interprets, or at least as enjoying the support of that theory. Put differently, while GPR is part and parcel of the physics that generates the Lorentz transformations, NPO is not in any way underpinned or even suggested by Relativity theory or by scientific methodology, and surely makes no contribution whatsoever to the science of Relativity.

(2) There's a stark difference in the language with which the two principles are articulated. GPR is surprisingly non-technical, uncomplicated, and stated with no recourse to special jargon, unfamiliar terms or odd uses of familiar

³ An illuminating and detailed discussion of GPR and its centrality for physics is found in Di Salle 2008.

⁴ One of the most explicit examples of the cruciality of GPR is Special Relativity. Thus, in Einstein's famous train experiment (see Einstein 1920, 30) it is the GPR that tells us that both observers, the one on the platform and the one in the train, are experiencing things *as they actually are*, even though one sees the two lightnings striking simultaneously and the other sees the same events as not-simultaneous. The GPR-based supposition that despite experiencing the situation differently, both observers can trust their senses is key for deriving the Lorentz transformations.

terms.⁵ NPO is the exact opposite. The use of “real” in its formulation is worse than odd, it is meaningless. As Austin stressed 80 years ago, no meaning can be attached to reality claims that are just made in the void, such as *X is real* (or *X exists*). Reality claims have meaning only in certain contexts, specifically, contexts which give a clear sense in which X could be not real. “We can perfectly well say of something that it is pink without knowing, without any reference to, what it is. But not so with real” (Austin 1962, 69). Imagine that you are told of an object inside a sealed box that it is *real*. You’d be guessing in the dark what sense to make of this proclamation (in contrast with being told that it is pink). You may think to yourself that it is a real diamond (Austin’s example, again), but that would be making sense of the statement by making explicit the relevant contrast—fake diamonds.⁶ Now, the central claim figuring in the formulation of the NPO principle is that things standing in a certain relation to me are “real”. But what are we to make of this use of “real”? How is it better than saying that the object in the sealed box is real? The key ingredient in the premises of Putnam’s argument from Relativity is, so it appears, not one we can attach a definite sense to.

(3) Let us assume for the sake of discussion that we do understand the NPO principle.⁷ Then the problem is that the argument premised on it blatantly begs the question. Here’s Putnam again:

R must be restricted to physical relations that are supposed to be independent of the choice of a coordinate system (as simultaneity was in classical physics) and to be definable in a “tenseless” way in terms of the fundamental notions of physics (Putnam 1967, 241).

For Putnam’s argument to work, a tenseless language has to be assumed, and *R* must be defined tenselessly. That, in turns, is tantamount to defining “now” in a tenseless way: *R* is the relation things have to me-*now* and to you-*now*. However, rendering “now” tenseless already grants the truth of the tenseless view of time,

5 In his *Dialogue Concerning the Two Chief World Systems* Galilei presents the ship thought experiment, which, demonstrates the GPR. The description of the situation in the ship and the experiment’s results do not pose a challenge to any intelligent reader.

6 This goes back to Kant’s objection to thinking of existence as a property —the paradoxality of such a thought is obvious: Vulcan, it turns out, is something that has many properties, among them being a planet, being of such and such a mass, but lacking the property of existing (for more see, for example, Donollan 1974).

7 Why so many readers never suspected its intelligibility is a question meriting a discussion. I conjecture that the reasons have to do with certain cultural trends that prevailed in the second part of the 20th century, but, other than the brief remarks towards the end of the paper, this topic will not be broached here.

or of eternalism⁸—few eternalists deny that some things are happening now while others happened before now and other will happen later, such statements are perfectly fine as far as eternalism is concerned, as long as *x is happening now* is understood to mean *x happens at the moment t in which x is located in tenseless time*, that is, as long as “now” is understood tenselessly. But if rendering “now” tenseless already establishes the truth of eternalism, then the appeal to Relativity theory is utterly superfluous. Worse, it turns out that the premises in the argument from Relativity to eternalism already assume eternalism, namely, that the argument is question begging.⁹

(4) In remark 2 above it has been observed that “real” can be used only when the context makes explicit a clear contrast with a manner of being not real. We now stress that being *past* is not a way of being *not real*. Pastness, as I’ve argued previously,¹⁰ is not an ontological category. There are real and many differences between the past, present and future. But these are not captured by reality claims, claims to the effect that present events are real in a manner that past and future events are not. I have long been insisting that our grip on tense consists, not in any imagined ontological distinctions, but in how tense is given in actual experience. Pastness, specifically, is anchored to the many emotive and epistemic manners in which pastness is experienced, and in the variety of sentiments, attitudes and beliefs, which are what they are in virtue of being occasioned by an event that is now past, or more accurately, occasioned by its being past. There are forms of knowledge (e.g., that it rained earlier in the day), feelings (satisfaction at how the meeting went or regret for not having joined the trip), dispositions (to retrospectively dismiss as a trifle the root-canal we were terrified by beforehand), which are typical exclusively of our experience of events that are now past and which are never met with in connection with events that are not past.¹¹ What we never encounter as a constitutive ele-

8 The differences that distinguish “the tenseless view” from eternalism, if there are any, are irrelevant to this paper.

9 In what may be an expression of an unconscious worry that he is committing this error Putnam writes —“It is unfair to assume a form of language which presupposes that Aristotle was wrong [here Aristotle is identified with an open-future conception of time —YD] and then to use the assumed correctness of this linguistic formalism as an argument against Aristotle” (Putnam 1967, 244).

10 See my (2007), as well as subsequent publications, especially my (2016b).

11 The claim is not that all knowledge is restricted only to what already happened. We have knowledge of present states of affairs, and perhaps also of future ones, but it is different in kind, has different groundings, and, most importantly, is experienced differently than knowledge of the past. Likewise, we can experience satisfaction as we anticipate something we are

ment of how we experience an event's pastness is its being "not-real", or it's being "ontologically absent", "ontologically inferior", or whatever locution is attempted here (the converse, the eternalist's thesis that past events are 'equally real' is just as much off the mark, of course).

Thinking of tense as an ontological issue, as having to do with whether events are real or not, exist or not, depending on where in time they are located, is probably the deepest and most widespread mistake in contemporary philosophy of time. Once tense is thought of in these terms one is forced to choose: either all and only what is present exists (the position of Putnam's "man on the street") or else all events are real even if they are not present —the conclusion Putnam derives from SR. However, this is an utterly bogus dilemma, both horns of which violate basic rules guiding the use of "real", which, moreover, is blind to the manner in which pastness, and tense in general, is attached to experience.¹² To sum up, underneath Putnam's NPO principle lurk many and serious issues. It so happens, however, that these problems have not been noticed. To the contrary, I believe NPO was regarded as an apparent offshoot of GPR, and the conviction that Relativity theory establishes the correctness of the tenseless view of time, or of eternalism, or of the block universe picture, has become widespread. Many take Putnam's argument to constitute a tight, rigorous derivation of eternalism from SR, a formal rendition of what Einstein himself expressed repeatedly as a scientifically based revelation regarding time, namely, that passage is an illusion.

3 Putnam vs. Stein

Still, Putnam's argument was not endorsed universally, and shortly after its publication voices of dissent were heard, most famously Stein's (1968). Stein was adamant that Putnam's reading of SR was mistaken, and he offered a rival interpretation for SR, one which keeps the present as a fact of objective reality, but collapses it to a point in spacetime. However, as I've argued elsewhere (Dolev 2018), in fact, far from negating Putnam, Stein actually reinforces him because Stein's present, captured by his notion of *becoming*, also boils down to things happening when and where they do, a characterization which, again (point 3

looking forward to, but again, the satisfaction is, sensuously, of a different kind than the satisfaction felt regarding something that has already transpired.

¹² To be clear, the experience-based conception of time I offer as an alternative to the ontological analysis is a form of *realism* regarding time, and pertains to objective rather than to merely psychological time, see my 2007; 2014.

above), is perfectly consistent with eternalism. In fact, since most eternalists are happy to concede that events occur, become, even “are present”, at the positions in space and tenseless times in which they are located, Stein’s local present may actually be an absolutely effective manner of relaying the gist of eternalism.

But before examining this weakness in Stein’s objections to Putnam, it is important to consider the motivations behind them. As far as I can tell, Stein’s qualms regarding Putnam’s *block universe* are fuelled by his conviction that, as much as possible, physics ought not to collide with the world as we know it from experience. And a salient feature of reality as we know it from experience, language and thought is the becoming of future events present and of present events past, that is, the passing of time. The error Stein wants to remove consists in the conclusion that Relativity theory is incompatible with this notion of *becoming*. Thus, Stein’s objection to Putnam’s argument is prompted, so I conjecture, by an urgent need to defuse the momentous conflict with experience that tenseless interpretations of SR run into.¹³

However, Stein’s proposal falls precisely into the pit it tries to escape, for it too ends up clashing, no less violently than Putnam’s interpretation, with experience. Stein resurrects tense —the spacetime manifold is divided to a past, a present or a future (though only partially —given point a point in spacetime it does not apply to regions that are space-like separated from it). But the price is intolerable —spatially limiting the present so that anything that is not here cannot be present runs against one of the most basic features of the world as we know it from experience, namely, that some events are present even though they are not *here*: a car is passing down in the street, an airplane is passing above in the sky, there are fish swimming in the ocean now, and at present the Bruins are ahead in the game against Vancouver, as can be seen on the TV screen in Boston. But if the present is spatially restricted, none of these things are actually happening now. In fact, they are not past or future either, because they are space-like separated from me-now.¹⁴ Even the clock is “there” on the wall, and not “here”, and so cannot be held as showing that it is now 12 PM. Stein’s becoming is restricted to a geometric, volumeless point, and so, absurdly, one cannot attribute presentness even to what is happening at the tip of one’s

¹³ It is worth recalling in this connection that Einstein himself was gravely troubled by the supposed clash between SR and experience (Carnap 1963, 37–38).

¹⁴ With the added uncomfortable corollary, pointed out by Putnam, that they were future and will be past but are never present.

nose.¹⁵ All this is, of course, in stark contrast with how we experience, speak and think.¹⁶

In short, many of the present events we experience are distant, sometimes we actually need instruments, such as TVs, to experience them, and distant places are the location of events that are happening now. As Whitehead (1977) already pointed out, the nature of experience commits us

(1) to the immediate presentation through the senses of an extended universe beyond ourselves and *simultaneous* with ourselves, (2) to the intellectual apprehension of a meaning to the question which asks what is *now immediately happening* in regions beyond the cognisance of our senses (Whitehead 1977, 127).

Thus, if Stein was motivated by a desire to harmonize SR with experience, the result was just the opposite. Stein's notion of becoming, which turned out to be music to the ears of eternalists, is just as foreign to experienced temporality as is the block universe.

The question of the spatial extent of the present is still being debated, but in the context of the present paper the moral I wish to derive from Stein's response to Putnam pertains rather to the significance of attention to experience —if I'm correct, Stein's initial conviction that Putnam was wrong in his interpretation of SR was motivated by Stein's belief that physics must align with experience and that, therefore, a frontal collision between physics and irremovable aspects of how we experience the world is indicative of a serious problem in our understanding of the physics in question. In this Stein was correct. As is argued below, for an interpretation of a scientific theory to be viable the tension between what the interpretation says of reality and what our experience says of it should be minimal.

15 Later elaborations of Stein's theses, e.g., in Hogarth and Norton 1995, suggested that the present, though spatially restricted, is voluminous and comprises a substantial chunk of space. The so-called "Alexandrov present" (discussed by Savitt in his 2010) belongs to this family of conjectures. However, these proposals bring no relief, as I discuss in 2016a; 2018.

16 There are also issues arising from the prevalent view that the Now is temporally volumeless, a point in time. Hence, it is claimed that because signals take time to travel, strictly speaking, we always experience the past. I hold the view in question, namely, that the present is point-like, to be an unfounded dogma. However, this topic cannot be discussed within the scope of this paper.

4 Experience vs. Theoretical Imposition

This moral ought to be stressed because it has become common practice to denounce ordinary experience as grossly inaccurate and utterly irrelevant insofar as understanding the fundamental structure of reality is concerned. But in truth, there's no escaping natural language when doing science. As I argue elsewhere, fundamental features of reality, for example, time having a direction, are not captured by the mathematics of physics or its laws, but rather enter physics as part of the ordinary language and experience which constitute the background for the development and operation of physics. Take for instance the notion of an "event". It is as prevalent in science as outside of it—trains moving along a platform, iron rods sliding through coils—these are the types of events Einstein reflected on as he was developing the ideas that led to SR. Without recourse to events in experience and thought there is no science. And events have salient, even constitutive properties and features which we only know from everyday experience, such as:

1. Events are not objects.
2. Events have duration, their temporal extent is not a volumeless point.
3. They are either past or present or future, regardless of spatial location.
4. There are contexts in which they constitute indivisible units. Here's Bergson: "We must return to the direct perception of change and mobility. Here is an immediate result of this effort. We shall think of all change, all movement, as being absolutely indivisible" (Bergson 2010, 167).

Each of these claims has been contested and negated. From Aristotle onwards¹⁷ it is assumed that events can be broken down *ad infinitum* and shown to be comprised of point-like temporal atoms. This is in conflict with 2 and 4. As for 1, a debate has been going on in the philosophical literature regarding the relationship between events and objects, with some writers, from Russell (1927) through Quine (1950) and nowadays Sider (2001), to name but a few, defending the claim that events just are objects of a certain kind. And as just discussed, 3 is supposedly overthrown by SR. The point is that these challenges are not to how we *experience* events but to how they are *conceptualized*. The way we experience events remains the same, and continues to include the above features, regardless of these challenges. You see the second hand of a clock skip from one line on the dial to the adjacent one. The event you are experiencing (as well as the event

¹⁷ More accurately, from Parmenides and Zeno onwards.

which is your experience) is a present event which spans a voluminous second, involves objects but is not one itself, and is experienced as an indivisible unity, even though it can, in thought, be broken down into successive parts.

The same holds for very distant events. A space-walk 45 light minutes away from Earth (say on one of Jupiter's moons) will be past by the time the video-stream from it can be seen on the monitors of the control center, but it will still be experienced like any other event —consisting of objects without itself being an object, spanning time, being past (rather than present or future) and constituting a unified whole. Even before images of it arrive, people at the control center will speak of it, and visually imagine it as all these things. No one in the control center would think it strange if a colleague commented —“if they are on schedule, the crew is five minutes away from completing their mission, let's hope all is going well”. To the contrary, nothing could be more straightforward, and more straightforwardly comprehensible, than such an utterance. Moreover, nothing could be more straightforward than apprehending the distant event as taking place *now*, as *present*, even if it will take another 45 minutes for live images of it to arrive.

It is impossible to *peel off* tense from how events are experienced, or thought of, no matter what kind of metaphysical doctrine one is committed to. Likewise, with the event's cohesiveness and duration. It is not possible in experience to deconstruct the space-walk and then re-experience it as consisting of a continuous series of infinitely many Zeno-like static, extension-less states. What is possible is to *argue* that the repair is *in fact* not one event but a series of point-like static states, that is, that in reality events are very much unlike what we experience them to be. Again, such arguments do not alter how events are experienced, only how they are conceptually analysed. But, if we wish to remain faithful to experience then, unless we are presented with irresistible reasons not to do so, we must accept events as we know them from experience. Whenever possible, the conclusions of arguments undermining what we know from experience should be rejected. When it comes to science, we are all the more committed to do so, for empirical science entirely relies and feeds on experience, even when it narrows its attention down to *experiment and observation*.

At the end of the day *experiment and observation* must themselves be experienced, namely, must themselves be experienced in the way that the moving of the second hand of the clock or the car in the street are experienced —*ordinarily*. Take away ordinary experience and you've lost science. Of course, if there are decisive conceptual arguments that force us to revise our experience-based beliefs about the nature and structure of events then we will be compelled to do so. To the best of my judgement, none of the arguments in the philosophical literature are conclusive in this manner. Science too can force, and indeed often does

forces us to re-evaluate and modify, sometimes quite radically, beliefs we hold about the objects and events we experience. Time dilation is a rather dramatic example. But none of these re-evaluations can lead to self-defeating conclusions, that is, to conclusions which, were they true, would undermine the possibility of doing the science that leads to them. Denying that events, or any of their properties, including those gleaned from ordinary language and experience, are part of reality, would be such a conclusion. Events, with their tensed properties (namely, their being past, or present, or future), are part of the world of science no less than they are ubiquitous in ordinary experience. Especially in the context of science, we should accept that events are what we experience them to be.

But I know that asserting science to be reliant on ordinary experience and language is contentious, and I will not push this thesis any further here. I do want to emphasize one claim that is central to the present discussion, which is, that the disagreements on this matter are not scientific but purely philosophical. The challenges briefly mentioned above to events being unified, cohesive wholes with temporal volume that are tensely located, were all conceptual, not one of them came from or was based on a scientific theory. To the contrary, again, science regularly works with the ordinary notion of event. If there is a dispute about the nature of events, or regarding science's reliance on the ordinary notion of events, the source of the dispute is always some *metaphysical* doctrine, as opposed to a physical, or scientific theory. Of course, this fact is masked by the fact that often it is physicists that voice the metaphysical doctrine in question. Take the often-cited case of Eddington's two tables, the *ordinary* one and the *scientific* one. The ordinary one is *substantial*, but not so the *scientific* one, which "is mostly emptiness. Sparsely scattered in that emptiness are numerous electric charges rushing about with great speed; but their combined bulk amounts to less than a billionth of the bulk of the table itself". Of our notion of the first, ordinary table Eddington says that it belongs to

conceptions which convey no authentic information of the back-ground and obtrude irrelevances into the scheme of knowledge...I need not tell you that modern physics has by delicate test and remorseless logic assured me that my second scientific table is the only one which is really there—wherever 'there' may be (Eddington 2010, x).

These are the words of an eminent physicist. However, according to a criterion given by another eminent scientist, C.S. Pierce, who was also a ground-breaking philosopher, every table is indeed substantial, and nothing could be more *really*

there than substantial, hard, solid tables (Peirce 1878).¹⁸ True, Pierce wrote before Eddington, but it's not due to lack of acquaintance with the science of Eddington's times that he offered his analysis of solidity. It is absolutely safe to assert that Pierce would have stood behind his analysis also after mastering the physics of Eddington's time, or, indeed, of current day physics. The clash between Eddington and Pierce regarding what's *really there* is not about scientific fact, and so cannot be settled by appeal to more science. One does not have to accept Pierce's pragmatic criterion, but one cannot reject it by citing science. The fact that on one side of the disagreement regarding the solidity of the table is found a highly respected physicist creates the false impression that those who reject the notion that the ordinary table is *really there* are clashing with physics, whereas in truth their clash is with other thinkers who defend an alternative metaphysics, one that is only paraded as science. The same is true regarding time and passage. Putnam in 1967 presents an argument in support of the so-called "block universe" and the claim that all events, regardless of their spatial location, are *equally real*. And he states that this picture is mandated by physics. Stein offers, on the basis of the same physics, what is (supposedly) an alternative picture.

However, neither has physics on his side. Physics is mute on this question, because, just like the question of the table's substantiality, it is not a scientific one. Rather it has to do with interpretation, and interpretations diverge not on scientific fact but on philosophical preferences. It is not science, but certain metaphysical stances that take themselves to be supported by science, that are hostile to the reality of ordinary tables or of time's passage, or, more generally, to everyday experience and language. Outside of these metaphysical prejudices, there is no reason to resist the claim that science routinely, indispensably, and irremovably employs notions taken from everyday experience. Moreover, and, in light of this, there's all the reason to adopt as a methodological principle the policy to strive, when interpreting a scientific theory, to do the least violence to ordinary language, and to seek and prefer an interpretation which harmonizes maximally the findings of science with pre-scientific knowledge of the world. A scientific theory that runs counter to deeply entrenched everyday concepts and beliefs presents us with a very grave predicament.

As noted above, guided by a scientific theory we can modify and alter, sometimes in radical ways, our beliefs about the world. But there's an important distinction to be made here, which was already introduced at the opening of the

¹⁸ Pierce speaks of hardness, but it is clear from the texts that Pierce and Eddington are thinking of the same property.

paper, between scientific ideas confirmed by measurement, and ideas derived from interpretations of scientific theories. *Time dilation* and Quantum *non-locality* are paradigmatic examples of the former. In both cases, however, there is no clash with everyday experience. Both phenomena belong to scales that are not directly experienced, and are witnessed with the aid of instruments, which are themselves experienced ordinarily, and which do not manifest these unique behaviors.¹⁹ In contrast, changes derived from interpretations of theories pertain to everyday experience. And because they are not grounded in measurement, they can be rejected without clashing with the theory, only with an undesirable interpretation of it. Our topic is a case in point. Thus, nothing about SR forces us to accept that, contrary to everything we can glean from reflection on experience, time's passage is merely an illusion, or that events are not tensely located, e.g., that our births are not really in the past, which would be the case if nothing was really past or present or future. Given that passage is not eliminable from experience, including from the very experiences that underpin the development of SR, dubbing it an illusion is almost self-refuting. If there's a way to reject this conclusion, and there is a way, we must opt for it.

Because science is there to explain, explore, predict the world we inhabit, which is the world we know from ordinary experience, there's no advantage to an interpretation of a theory that does violence to basic, irremovable features of experience. If someone chooses to silence the testimony of sensory experience and adopt a conception of the world structured around a narration inspired by scientific theory, no one can prevent him from that. But it is important when confronted with such cases to highlight the fact that the choice is one of philosophical preference, not one condoned by scientific theory or its interpretation. That's exactly what Bergson did when he remarked to Einstein that the latter's rejection of passing time as merely *psychological* is a philosophical, metaphysical stance and that as such it is "a metaphysics grafted upon science, it is not science" (Bergson 1999, 47). To accept the testimony of experience and continue to think and speak (and experience) the table as substantial and events as tensed, or to go with an alternative conception which rejects these assertions as merely reflecting one's psychology —this is not a dilemma between science and everyday experience, or between science and philosophy. It is a dilemma between two philosophical approaches to the world and to experience, neither of which is more grounded in science than the other.

¹⁹ Much technology utilized Quantum Mechanics (lasers, random number generators) and Relativity (GPS). But experiences of the instruments that employ such technologies never includes direct experience of non-locality or of time-dilation.

Sellars (1962) famously pitched the scientific and the manifest images against each other, giving fundamental primacy, at the end of analysis, to the scientific image. Towards the end of his life, decades after *Time and Physical Geometry*, and from a very different philosophical position than the one he held in the 1960s, Putnam rejected Sellars dichotomy and argued that the scientific and manifest images do not actually clash, that neither is superior with respect to the other and that, rather, “a realist needs to recognize that the world has many levels of form, and theoretical physics is not the measure of all things” (Putnam 2016, 119). Bergson too was a conceptual pluralist, which, as for Putnam, meant being a realist also about aspects and facts of reality that are not captured by, and are not reduceable to, scientific language or theory. The same goes for James and Wittgenstein. None of these thinkers harbored any anti-scientific sentiments. To the contrary, they had immense appreciation for science and its achievements, but their conception of reality, grounded as it was in the infinite richness and diversity of human experience, included more than what science tells us about it, as invaluable and ingenious as the teachings of scientists are.

5 Bergson vs. Einstein, Humanism vs. Scientism

Science is currently under attack —deniers of global warming are spearheading the assault, opposers of vaccination join them, flat-earthers, of which, amazingly, there are thousands, add a colorful touch to this cacophony. Then there are cult leaders who create their own pseudo-science, such as Marshall Applewhite, the founder of Heaven’s Gates, who’s “science” promised his followers that the 1997 the Hale Bopp Comet was there to carry them to TELAH, *The Evolutionary Level Above Human*, all they needed to do in order to board the vehicle was commit suicide.²⁰ I mention these anti-scientific, dangerous, attitudes so as to draw a clear and sharp distinction between them and a criticism I find valid and urgent, not of science, but of what is sometimes called *scientism*. Scientism is a philosophical stance which, to put it crudely, gives science absolute authority as the sole source of genuine knowledge and understanding, while decrying everyday experience and language for being vague, inaccurate, unreliable, prone to error, etc.

When presented with the many questions and phenomena about which science is, for the moment, at least, mute, scientismists, if they can be called this

²⁰ At the time this paper is being written Covid19 is breeding a new brand of anti-scientific sentiment.

way, have a ready rejoinder—future science has answers. This rebuttal is invoked even in relation to topics that cannot so much as be framed in scientific terms, such as those pertaining to meaning, normativity, freedom.²¹ I’ve been arguing that the reality of time’s passage is another question which cannot be settled scientifically because it cannot even be posed as a scientific question. *Future science*, used in this manner, as a blanket and content-wise hollow promise, is nothing other than a form of Messianism. That proponents of scientism tend to present their arguments as scientific, or as grounded in science, which, of course, they are not, does not change this.

In opposition to scientism there’s the view—for the purposes of the present discussion let us, following James, call it Humanism—which is premised on the basic principle that the world *just is* the world as it is given to us in experience, and that, moreover, in studying this world no kind of experience can be ruled out on *a-priori* grounds as irrelevant to the study. Specifically, humanism rejects the supposition that we must repress (in what would be an utterly unscientific manner) the data and evidence emerging from reflection on and the exploration of everyday experience and language. These, according to humanists, are vital if we are to get a clear understanding of the many phenomena that make up our environment and of our place in it. Humanism insists that the world studied by science is the very same world as the one we live in and are acquainted with from everyday experience, and that to decree, in advance, that only science, and not everyday experience, is pertinent to our exploration of this world is nothing but dogma.

It is of course worth mentioning that some proponents of Humanism were themselves scientists or philosophers well versed in the science of their day, such as James and Wittgenstein, and later Putnam. There’s absolutely nothing anti-scientific about Humanism. To the contrary, Humanism celebrates science. But it does not forget that science is an activity conducted by human beings, who are irremovably embedded in everyday language and experience. Moreover, it focuses on how everyday language and experience figure as essential and irreplaceable scaffoldings sustaining science, its methods, its specialized languages,

²¹ Of course, it is possible to perform an MRI on the brain of a subject who is in the process of exercising her freedom of choice with regard to some task. But to identify freedom of choice with brain processes requires much more than MRI images, it requires a philosophical argument. Similarly, for basing a denial of freedom of choice on empirical evidence. In general, the contention that scientific findings settle philosophical issues is usually supported by arguments that are blatantly circular, that is, that first identify some phenomenon with physical processes and then present the scientific theory of that process as science’s contribution to, not to say “resolution”, of the philosophical inquiry.

and so on. You can remove scientific terms, notions, and concepts from everyday language, you cannot remove everyday language from science. What motivates both schools? Scientism is driven, at least in part, by the praiseworthy ambition that fuelled logical positivism at the time, namely, the desire to establish our conception of reality on nothing other than hard fact and rational reasoning. Positivists such as Ayer were uncompromising —it's either *scientific* or *nonsense*.

It is however important to remember that for the Vienna Circle, the forum which formulated many of the principles of logical positivism, the insistence on this *science or nonsense* dichotomy was prompted to no marginal degree by the pressing political circumstances under which, and, to an extent, due to which, they met, namely, those of post WWI and pre-WWII Europe. The dismissal of all that is not scientific did not arise logically out of a philosophical analysis, but from the worry that it is non-scientific sources of knowledge, understanding and opinion, specifically religion, metaphysics and ideology, that are responsible for the disaster of WWI. As is made abundantly clear in Neurath's manifesto,²² no less than in philosophy, the Vienna Circle was interested in the political reshaping of society, thinking that it is the only way to thwart another world war. It is thus no coincidence that the push towards "the elimination of metaphysics", to use Ayer's term, erupted between the wars. In the context of these historical circumstances scientism is seen less as a programmatic philosophical framework and more as a negation of cultural currents that are perceived as highly dangerous.

However, outside the political/historical context, scientism itself becomes an ideology, a philosophical framework serving the idea that scientific theory *alone* offers reliable knowledge and understanding of reality. The attack on everyday language and experience is a by-product of this ideology, which at present cannot be justified by appeal to external, political conditions. And it is a harmful attack, philosophically speaking, for, as indicated throughout this paper, everyday language and experience are the platform sustaining science and its interpretation. Done in the name of science, the repudiation of everyday language and experience, is self-defeating. Almost ironically, Humanism turns out to be more faithful to the scientific spirit, understood broadly, for, as already pointed out, it is driven by interest in and curiosity with respect to all experience-based evidence, including that of everyday experience. James' pragmatism, like that of Pierce's before him, is very much inspired by science, and by the conviction that the only route to knowledge and understanding is observation and study of what we experience. However, for him the realm of experience includes our inner

22 Chapter 9 of his *Empiricism and Sociology* (1973).

lives — sentiments, dispositions, attitudes, emotions, as well as whatever can be gleaned from attentiveness to everyday language.

This is true of Wittgenstein as well. Needless to say, when the field of our empirical research is allowed to go beyond sensory perception and to include, for example, our emotive stance vis-à-vis what we see, our sentimental reaction to what we experience, when the salient and constitutional normative aspects of many of our dealings and interactions with our environment are also accepted as part of the empirical data on which we structure our knowledge and understanding, we get a richer, fuller, profounder understanding of reality. At the same time, the many pitfalls logical positivists justifiably worried about reopen before us. Many disagreements arise that cannot be settled in the lab or by calculation and logical analysis. Interests, tastes, opinions, biases, goals re-enter the picture. What Humanists knew all along, however, is that scientism too is not invulnerable to these pitfalls. They are a fact of existence, even in science itself. As Duhem has long ago and so persuasively demonstrated, even in the course of doing science, crucial disagreements are resolved, ultimately, not by further observation and analysis, but by scientists' appeal to their good sense (much of Kuhn's work is a detailing of this very assertion). Not only does scientism not constitute a defense against the pitfalls threatening any attempt to investigate reality, it is in fact the result of falling into one, namely, tampering with evidence by falsely discrediting some of it. It is a dogmatic doctrine which turns its back on crucial input —the one found in the painstaking phenomenological analysis of everyday language and experience.

Moreover, scientism actually plays into the hands of the very enemies it faces, namely, the adversaries of scientific advancement mentioned in the opening of this section. It fuels anti-scientific sentiments by portraying science as, to quote Putnam (paraphrasing Protagoras) again, "the measure of all things", which it is not, and making in the name of science false promises, e.g., to resolve philosophical issues. Science has not established that passage is an illusion, or that tables are not hard, or that free will is a myth. To propound these claims in the name of science is to alienate science from human life and to saddle it with the kind of indefensible folly it should never be associated with, none of which helps its popular reputation. Einstein himself was not an advocate of scientism. To the contrary, his strong verificationism, placed human observation at the heart of the scientific enterprise. But, as the last hundred years have taught us, when philosophy is highly attentive to science it can evolve into scientism. The remedy is not to stop being attentive to science, but to be cautious not to lapse into scientism.

It is an unfortunate twist in the history of 20th century philosophy that a philosophical movement, which breathed unprecedentedly fresh life into verificationism,

thereby giving immense weight to what humans can confirm by means of their own experience, ended up serving a philosophical agenda in which human experience is marginalized to the point of losing significance. I read Bergson's comments on Relativity as an attempt to warn against this development. At the time his voice was silenced. It appears as though it is beginning to be heard again.

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