§1 Introduction

This essay defends two related conclusions regarding the interpretation of Wittgenstein’s *Tractatus Logico-philosophicus*. The first, and more restricted, goal is simply to offer an interpretation of Wittgenstein’s discussion of physics at §§6.3-6.4. Although not entirely neglected (cf. Bond 2006; Jones 1985), this discussion has received relatively little discussion in the literature, relative to, for example, Wittgenstein’s treatments of logic and mathematics.1 However, I will argue here that Wittgenstein’s discussion of physics can stand on its own two feet, so to speak. Wittgenstein offers an intriguing and, in many ways insightful, analysis of physical theory bearing the marks of both his early exposure to Schopenhauerian and neo-Kantian philosophy and his encounter with Russell. Ultimately, what we will discover is that Wittgenstein offers an account of science that, in most ways, rests squarely within what later comes to be called the analytic tradition.

And, this leads to the second, and more general, strand of my argument. These sections of *Tractatus* occupy an intriguing position, functioning directly as the transition between the early sections of the work that most directly support the traditional reading of *Tractatus* as a classic in the logical analysis of language and the puzzling concluding sections. *And this is not an accident!* It is precisely the conclusion of Wittgenstein’s

1 Although there has been increasing attention paid to the influence of Wittgenstein’s own engineering background, and to the scientific context of its composition more generally, on the the overall philosophical project of *Tractatus*. See, for example, (Preston 2008; Sterrett 2001; Visser 1999). (Nordmann 2002) is a general discussion of this trend.
account of physics that the work of relatively straightforward philosophical analysis that occupies the majority of Tractatus simply cannot do the work that we want philosophy to do. If even physics, the paradigmatic candidate for logical analysis, remains beyond our grasp, how much more so must the truly deep philosophical questions regarding the nature of Self and Other, Ethics and Freedom. This is a conclusion that poses problems for both of the two dominant interpretations of Tractatus. The conclusion that fundamental physical concepts, such as those of natural law, have precisely the same status as Fate, that they require an act of faith, raises serious problems for more traditional readings. However, the fact that this is clearly the conclusion of an argument raises equally severe problems for the so-called resolute readings.

Thus, this paper has a somewhat complicated structure. The discussion of Tractarian philosophy of physics will be framed by a discussion of the fundamental battling interpretations of the Tractatus, which I will call the Russellian and the anti-Russellian reading. The majority of the paper, however, is devoted to a close reading of §§6.3-6.4. In the course of this discussion we will discover that Wittgenstein offers quite intriguing suggestions regarding classical problems in the philosophy of physics, including the nature of physical space and the role of incongruent counterparts, the nature of causal inference and the philosophical and logical status of physical laws. However, the two most important conclusions to be drawn relate to the more general debate. First, that it seems to require considerable violence to the text to claim that Wittgenstein is not here defending what is best called a philosophical theory about the structure of natural science. Second, that the consequences of that theory lead directly to the conclusion that, in some important sense, all such theories are fundamentally vacuous.
§2 Two Modes of Interpretation

Two distinct varieties of interpretation dominate the contemporary literature on the interpretation of Wittgenstein’s *Tractatus Logico-philosophicus*. The older of the two models reads Wittgenstein’s project, inherited from Russell and Frege, as that of developing a linguistic philosophy and linguistic metaphysics. Interpreters in this tradition, roughly, adhere to the understanding of *Tractatus* adumbrated in Russell’s introduction. On this reading, the development of the picture theory of language and its related account of logic is the fundamental goal of *Tractatus*.² Picturesquely, we might say that this standard tradition reads *Tractatus* from front to back.

The alternative position reads in precisely the opposite direction. Beginning, again roughly, with Cora Diamond’s “Throwing away the ladder” (Diamond 1988), representatives of this tradition begin with the end of *Tractatus*-often the very end-and ask what Wittgenstein could possibly have meant and how could possibly have gotten there.³ These questions lead these interpreters to a quite different conception of Wittgenstein’s project. On this view, *Tractatus* constitutes a first failed attempt at the therapeutic project characteristic of *Philosophical Investigations* and the other late work. Given this reading, problems that tend to concern the more traditional interpreters regarding the meaning and adequacy of Wittgenstein’s account of representation tend to

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² In addition to Russell’s introduction see especially Max Black’s *A Companion to Wittgenstein’s Tractatus* (Black 1964) and Anscombe’s *An Introduction to the Tractatus* (Anscombe 1959). P. M. S. Hacker, “Was he trying to whistle it?” (Hacker 2000) defends the traditional reading directly against the newer anti-Russellian reading.

³ The best general source for the anti-Russellian tradition remains (Crary and Read 2000), especially the essays in Part II. A more recent account can be found in James Conant’s essay in *Wittgenstein and the Moral Life* (Diamond and Crary 2007), “Mild Mono-Wittgensteinianism.” *Post-analytic Tractatus* (Stocker 2004) provides additional versions of this tradition.
fall away because this account of representation no longer matters as philosophical theory but merely as adidactic or therapeutic device leading to its own destruction.

Unfortunately, both of these readings are, at best, incomplete. The “new” Wittgensteinians are correct; we must read the sections on mysticism and ethics, all the way to the end, as expressing the fundamental point of *Tractatus* and thus as deeply continuous with the goals of his later philosophy. However, the execution of that project is radically different from the later philosophy, and this difference can only be discerned when we treat the theory of representation of *Tractatus* seriously as a theory of representation. In essence, I claim that Wittgenstein is doing what the Russellians takes him to be doing, but only for the purposes that the anti-Russellians articulate.

Wittgenstein offers a theory of representation, language and logic—what he takes to be the correct such theory—only in order to show that the project of developing such theories is essentially misguided. Such theories leave all of the most significant areas of human experience and endeavor beyond reach. Thus, *Tractatus* occupies a halfway house between traditional or standard philosophy and the purely therapeutic approach of *Philosophical Investigations*. It, I claim, offers a standard philosophical argument, a reductio, of traditional philosophy for therapeutic purposes.

While a complete defense of this reading of *Tractatus* lies beyond the scope of a single paper, an examination of a much-neglected section of the work will demonstrate both its utility and plausibility. From 6.3-6.4 Wittgenstein presents an extended (by the

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4 While James Conant has recently moderated his interpretation, his “mild mono-Wittgensteinianism” is not mild in this sense. He continues to assert that the fundamental feature of the resolute readings remains the denial that any philosophical doctrines, or arguments for such doctrines, appear in *Tractatus*. Any apparent such doctrines serve a merely dialectical purpose.
standards of *Tractatus*) treatment of natural law and causality in physics.⁵ He concludes that these concepts have precisely the same status as God and Fate; they serve as unspeakable endpoints to inquiry. This section of *Tractatus* occupies a fundamental role in adjudicating the debate sketched above because it serves directly as the transition between the logical-linguistic investigations and the ethical-mystical investigations that distinguish the two readings. In particular, he shows, via an application of his logical theory to a realm of human endeavor that he had earlier held out as the epitome of the sayable (§4.11), the extent to which humanities deepest endeavors are hidden behind the veil of logic. Only by understanding both Wittgenstein’s anti-philosophical goals and his traditional philosophical methodology can we really make sense of this transitional section. In the remainder of this essay I offer an interpretation of the 6.3’s that demonstrates that Wittgenstein is offering a relatively coherent philosophy of physics in terms of his theory of representation—a project that only makes sense if we take that theory seriously—and that the purpose of that philosophical analysis is to undermine the process of providing such an analysis in favor of “simple” practice.

§3 A Tractarian Philosophy of Physics

At 4.11 Wittgenstein writes, “The totality of true propositions is the total natural science (or the totality of the natural sciences).” The role of this claim as a demarcation between scientific and other modes thought and inquiry, reiterated at 6.53, has received the majority of the attention from those Wittgenstein interpreters concerned with the role

⁵ The only reasonably detailed treatment of this section as philosophy of science in the literature seems to be that in (Black 1966). However, he treats this section principally as a freestanding speculation in the philosophy of science, not as an integral phase in Wittgenstein’s project.
of science in *Tractatus*.\(^6\) However, this poses two interrelated problems. First, as a claim in the philosophy of science, it provides almost no guidance. Most science is not actually true, and actual science consists of far more than a catalog of unrelated propositions, whether true or not. What then does Wittgenstein *mean* here by “the totality of the natural sciences” and how are we to recognize it?

Second, sandwiched between the two occurrences of this claim Wittgenstein himself presents an analysis of physics according to which most of physics is *not* even factual in this sense, let alone true. In proposition number 6.3 and the following propositions, Wittgenstein sketches a more adequate philosophy of science; one that goes to the heart of his philosophy. He offers a philosophy of physics, dealing especially with causation, space and time, according which most of the structure of actual physical theory possesses a merely logico-transcendental structure and lacks significant content. In particular, according to Wittgenstein, we impose the law-like structure of cause and effect through our inquiry. A brief comparison with Kant’s apparently similar understanding may be useful here. Both for Kant and for Wittgenstein causality is an order imposed on the world by us, and it is this status as an ordering principle for science or experience that I take as central to the transcendental status of these principles.

However, Kant’s principle of causality possesses a necessity that Wittgenstein’s lacks. A transcendental, or governing, principle for some realm of experience or knowledge is necessary if that is the only principle that might govern that realm. For example, Kant seems to claim that without the “imposition” of causality, there would not

\(^6\) This demarcational role for natural science continues to draw attention from commentator. See especially the papers by Costello, Hutto and Stocker in (Stocker 2004).
be any experience\textsuperscript{7}. The transcendental structures of Wittgenstein’s that we will be concerned with are not necessary in this sense. They are purely logical structures that we are free to dispose of (barring psychological commitments) if better ones come along, which they might. We might here contrast these structures with the picture theory of language proper understood as articulating the necessary conditions of any representation at all.\textsuperscript{8} These structures might be called logico-transcendental to distinguish them from the pure transcendental structures of Kant, and perhaps of Wittgenstein. Ultimately, Wittgenstein’s philosophy of physics ends up bearing both important surface similarities and deep differences to the conventionalist philosophy of science common to this period.

The rest of this section consists of a brief survey of the structure of the 6.3’s followed by a more detailed consideration of certain aspects of this part of the \textit{Tractatus}, in particular the logico-transcendental character of certain apparently empirical aspects of physics such as causality, conservation and being located in space. In 6.3 Wittgenstein writes, “Outside of logic all is accident.” The rest of the propositions up to 6.4 develop that theme in greater detail. In 6.31-6.33, he claims that the status of certain apparent regularities is other than we believed it to be. Wittgenstein’s insistence on a purely logical, in fact truth-functional, \textit{a priori} undermines any attempt to treat certain statements as both significant (synthetic) and as \textit{a priori} true. In 6.31 he denies the \textit{a

\textsuperscript{8} Here I am ignoring debates over the status of divine knowers and intellectual intuition in Kant. Clearly, Kant believes that the the categories are a necessary condition for any \textit{discursive} or \textit{human} understanding, in a way that Wittgenstein does not. This ties into the distinction between Kant’s project and Wittgenstein’s drawn by Paul Engelmann that Wittgenstein intends to elucidate the conditions of representation in general while Kant focuses merely on \textit{human} representation. Cf. (Engelmann and Wittgenstein 1967, esp. pp. 99-100)
priori character of induction while in 6.32 and 6.33 he affirms the logical character of the “law of causality.” In 6.34-6.3432 Wittgenstein’s examination of Newtonian mechanics illustrates the status of law-like claims in the natural sciences. In 6.35-6.36111 he considers causality in additional detail, with an aside on the status of space and time. Finally, in 6.37-6.3751, he comes full circle and argues against non-logical necessity in additional detail.

Wittgenstein’s first comment on the issue of regularity would only seem to widen the gap that I indicated in the introduction to this section. Clearly his system requires that all regularity be logical regularity because atomic facts are independent of each other.\footnote{A note on the translation is in order here. The word Ogden translates as “regularity” is the German “Gesetzmassigkeit.” Unlike the English, the German carries with it a sense of law- or rule-governedness. “Ein Gesetz” is a law and in colloquial German “Gesetzmassigkeit” can also mean “legality.” Thanks are due to Peter Hylton for pointing this out in comments on an earlier draft of this paper.} The existence of a given atomic fact cannot affect the existence or non-existence of any other atomic fact. Therefore, since elementary propositions have atomic facts as their content they must be independent of each other as well. Therefore any connection between facts or propositions must arise through the combination of atomic facts (elementary propositions). However, the combination of elementary propositions to form complex propositions just is logic. Thus all connections between facts, all regularities, must be logical.

While his system may require it, this claim does leave Wittgenstein with some problems. In particular the status of the apparently non-logical regularities that we see around us becomes unclear. If “the investigation of logic means the investigation of all regularity (6.3),” what about the apparently non-logical regularities we see around us,
causal laws and conservation laws and even the law of causality. Wittgenstein claims that they are purely logical in character. He argues for this primarily through a consideration of “the law of causality” beginning in 6.32. Wittgenstein claims that this law has a purely logical character; it is “not a law but the form of a law (6.32)” or “a class name (6.321).” Thus the law of causality establishes the logical form of a set of propositions.

In 6.341 and 6.342 Wittgenstein appeals to an analogy originally introduced in 4.063 to illustrate this conception. Consider the world as a white plane with each point representing a possible atomic fact. Turn the point that correlates with each existent atomic fact black. You now have the “white surface with irregular black spots” of 6.341. One way of describing this surface is to specify the color value of each point independently. Then, if the pattern is truly random, each element of the description will be independent. This is analogous to directly specifying the state description of the world as a list of elementary propositions. Alternatively we could use a grid to partition the surface into areas larger than a single point. If there are areas of the same color larger than a single point, then for any shape of grid (square, triangle, hexagon, etc.), there is a partition of that shape that generates a complete description of the plane. You need only specify the color of each grid partition, rather than of each independent point.¹⁰

Mechanics serves as such a grid held up to the world. Newtonian mechanics attempts to completely describe the world (or some large segment of it) using only propositions of a certain limited number of logical forms. For Wittgenstein, a logical form, or the form of a proposition, just is a truth-function of elementary propositions. More accurately, a proposition itself is the truth function of elementary propositions (5).

¹⁰ The general truth of this claim, especially for continuous spaces, is far from clear. However, that does not seem to effect the interpretation of the analogy offered below.
Therefore, the logical form of the complex proposition is the statement of the truth-functional properties of the proposition. An explicit specification of the logical form of some class of propositions involves, first, the statement of how many elementary propositions go into a complex proposition of that form. Second, the logical form specifies the truth-functional relationships that those elementary propositions bear to each other. Thus, a logical form involves a set number of elementary propositions in a set relationship. Therefore mechanics divides the world in a systematic way analogous to the partitioning of the surface by a grid.

Importantly, the shape of the grid does not matter. Whatever shape, or logical form, we choose, at least, one adequate grid of that shape exists. However, not every sized grid of a given shape serves to generate an adequate description of the surface. If we draw our net too widely, we lose necessary detail. There is a maximum size for any grid of a given shape. Therefore, that we can use a triangular or hexagonal grid to completely describe the surface does not say anything about the surface. Similarly, that we can generate a mechanical description of the world does not inform. However, that a particular grid, a grid of a given shape and of a given fineness, serves to generate an adequate description is informative. The mechanical equivalent to the choice of grid fineness is the choice of a set of force laws. That some particular physics generates an adequate description does say something about the world. In the case of the plane, the maximum effective size of the grid provides information about the size and scale of the accidental patterns in the picture.

This is, in fact, not quite correct if we are to assume that the “grid” consists of a regularly repeating regular polygon, a regular tessellation. There are only three regular
tessellations—equilateral triangles, squares and hexagons. In addition, there are 8 semi-
regular tessellations constructed of repeating patterns of more than one distinct regular
polygon. However, there remains a useful analogy with logic here. The equivalent to
forming a tessellation would be constituting an expressively complete base for truth-
functional logic. As in the case with tilings of space, not every arbitrary set of truth-
functions is expressively complete. However, all expressively complete bases are
formally equivalent. Just any tessellation can be replaced by any other tessellation
without losing information about the surface, any expressively complete base can be used
to make all of the same statements.\footnote{For a useful introduction to tilings and
tessellations see \textit{(Tessellation 2008)} with associated links and references. The existence
of non-repeating or \textit{aperiodic} tessellations seems to pose a problem for the analogy. But, all
analogies break down someplace.}

Similarly, that one system of mechanics allows a simpler explanation than another
does say something about the world. A consideration of the relationship of Newtonian
mechanics and special relativistic mechanics illustrates this. There is a reformulation of
classical mechanics empirically equivalent to special relativity. We generate such a
reformulation through the addition of new force laws to classical mechanics. In fact, the
famous Lorentz-Fitzgerald contraction, which eventually became the length contraction
effect of special relativity, was originally a classical force law. Thus, even if the classical
and the relativistic mechanics are empirically equivalent, the relativistic formulation is
essentially simpler in that it involves fewer force laws. The fact of this additional
simplicity says something about the world.

In propositions 6.35-6.36\textsuperscript{11} Wittgenstein considers the causal law-like aspects of
mechanical propositions directly. In 6.35 he considers the contrast between the apparent \textit{a}
priori necessity and the apparent empirical content of the law of causality. On at least one obvious reading it says that all events in the world have a cause; it appears to make a claim about the world that might be false. However, 6.3 makes that reading untenable. Therefore the necessity of the law of causality must be logical, so Wittgenstein hints at another reading. The law of causality characterizes the symbolism in which we construct our science. However, mechanics is only the logical structure—the grid that we use to partition the world. As such we can have a priori knowledge of its structure through logic, just as geometry can provide a priori knowledge of the structure of one of our grids. In neither case does that a priori knowledge tell us anything about the world so partitioned.

In 6.36 Wittgenstein considers a restatement of the law of causality that makes this particularly clear. If we restate the law as “There are natural laws (6.36),” it becomes clear that the law is equivalent to a claim, “There are true propositions of such and such a form.” However this cannot even be sayable because logical form only shows itself in propositions. This cannot be a proposition because it makes no claim on the world; it is an attempt to make a statement about the symbolism.

This leads into a consideration of space, time and their relation to causality as the “arena” or terms of measurement of regularities. He argues that the passage of time is only the comparison of the rates of different processes, for example of the movement of the hands of a chronometer with a marble on an inclined plane. The obvious difficulty with this treatment lies in the definition of a process. What makes those two things comparable in that way? Wittgenstein would respond that we do. We connect the events in the world into processes that we use to define the passage of something that we call
time. We generate space in the same way, but out of causal interactions. While we connect events into processes by locating them in time, we connect mechanical cause and effect by locating them in space.

In a particularly puzzling passage in 6.3611 Wittgenstein writes:

> When for example, we say that neither of two events (which mutually exclude one another) can occur, because there is no cause why the one should occur rather than the other, it is really a matter of our being unable to describe one of the two events unless there is some sort of asymmetry. And if there is such an asymmetry, we can regard this as the cause of the occurrence of the one and of the non-occurrence of the other.

In mechanics we might interpret this “asymmetry” as follows. Consider some system in a state of equilibrium, for example inertial motion. We say that it will not leave that state unless there is a force applied to it in some direction. More accurately it will not exit that state unless there is more force applied in one direction than in any other. In the case of inertial motion, the two events might be acceleration in the +x direction or in the -x direction. These two events are mutually exclusive. Neither event occurs without some cause that also prohibits the other. If one of them occurs, there is always an asymmetry associated with it, for example more force or a greater mass density or a greater electric charge along the +x direction. Unless there is such an asymmetry, we cannot have a recognizably mechanical description of the event. To talk about an acceleration without an associated force in Newtonian mechanics is to abandon that mechanics. Through physical space we specify and interrelate the various asymmetries of mechanics. We talk
about asymmetries occurring in space and processes occurring in time but space and time are simply how we organize the events under consideration.

The problem with this treatment of space, as opposed to time, is that we seem to have an \textit{a priori} science of space, geometry. While we talk about the passage of time in the abstract, no one has ever really gotten a handle on what it is. We always seem to end up talking about an actual process. However, in geometry we do have a treatment of abstract space. This seems to indicate that whatever space might be, it must be logically prior to the world, in a way that, on this reading, time is not. In 6.3611 Wittgenstein responds to this concern with an argument that geometrical and physical space cannot be identical. He bases this argument on a consideration of so-called incongruent counterparts. A pair of incongruent counterparts is a pair of figures that considered in isolation possess identical geometrical characteristics, but that we cannot exactly superimpose unless we rotate them out of their space. The classic example of such is the right and the left hand. Incongruent counterparts form a puzzle for geometry. Viewed from one perspective they seem congruent, but from another, not. Wittgenstein argues that there is no puzzle, only a confusion of identity conditions. From a purely geometrical perspective incongruent counterparts are not incongruent.

As Wittgenstein writes, “A right-hand glove could be put on a left hand if it could be turned round in four-dimensional space (6.3611).” Wittgenstein claims that all incongruent counterparts are essentially similar to his proposed one-dimensional version. He creates this pair by marking opposite ends of two equal length line segments with the same symbol. At first glance Wittgenstein appears to have misrepresented the concept of incongruent counterparts because it is impossible to distinguish the two ends within one-
dimensional space. The marks convert the line segments into two-dimensional figures, and considered as such they are congruent. However, I believe that Wittgenstein’s point is subtler. It just is the point that asymmetries in so-called geometrical spaces are always imposed externally, either from a higher dimensional space or from mechanical consideration. Incongruent counterparts result from the physical impossibility of perfectly acceptable geometrical operations. More precisely, while geometrical space is perfectly symmetric, physical space is essentially asymmetric, in that we generate it out of asymmetries.

There are two final lessons that we will need from this section. In 6.371 and 6.372 Wittgenstein addresses the explanatory character of law-like scientific claims directly. That character is illusory in exactly the same way and for the same reason that the appearance that a disjunction sign explains disjunction is. The explanatory law-like character results from our free choice to construct our description of the world in mechanical symbolism, just as the use of the disjunction sign results from our choice of disjunction-negation as opposed to conjunction-negation base. Because we embrace the illusion that science explains natural phenomena, we believe that science explains everything without remainder. This is both right and wrong; we have come to the end of inquiry when we have a complete description of the world, the end of what we might say. However, once we see the illusion as such, we realize that there is a remainder. We must accept that inquiry has a terminus. For the ancients this terminus was God or Fate; Wittgenstein places logical form, actually natural laws, in the same situation. However, that law-likeness is a purely logical property of the sentences, and as such is not an object of inquiry. Finally, Wittgenstein reminds us that none of the propositions of physics or
mechanics could be an elementary proposition because we can always generate
tautologies and contradictions out of them.

§3 Philosophy of Science and the Argument of *Tractatus*

Given the interpretation of 6.3ff. offered above, Wittgenstein develops, out of the
basic resources of the *Tractatus*, a fairly systematic interpretation of the structure of
physics. In fact, Wittgenstein’s treatment of the linked problems of causality, space and
time is his most developed such treatment, other than the direct treatment of logic itself.
As I suggested above, this fact, combined with the pivotal location of this discussion in
*Tractatus*, leads me to claim that it may contain the fundamental clues to an interpretation
of Wittgenstein’s project.

What conclusions about *Tractatus* and its interpretation can we draw from
Wittgenstein’s discussion of physics? First, we must recognize the very real proto-logical
positivist, proto-analytic, nature of *Tractatus*. *Tractatus* clearly does echo and develop
themes characteristic of logical positivist philosophy of science, particularly those that
originate in Mach and Poincaré. Second, however, Wittgenstein understands the
consequences of this logical analysis in a very different way from some of his successors.

In order to clarify these connections, let us consider two sets of connections
between Wittgenstein’s philosophy of physics in *Tractatus* and the logical empiricists.
First, consider briefly both a clear predecessor and a clear successor to Wittgenstein’s
general account of scientific law. As we saw above, Wittgenstein’s considers scientific
laws as serving a fundamentally organizational role in science; they determine the logical
form in which we will express the particular facts discovered in scientific enquiry. The
similarity to Ernst Mach, minus Mach’s phenomenalism, should be clear here. Mach
considers physical laws as rules for reconstructing in imagination a collection of particular facts of special interest, what Mach calls the “economy of science.” Consider for example, the following from Science of Mechanics:

Thus, instead of noting individual cases of light-refraction, we can mentally reconstruct all present and future cases, if we know that the incident ray, the refracted ray, and the perpendicular lie in the same plane and that \( \frac{\sin \alpha}{\sin \beta} = n \). Here, instead of the numberless cases of refraction in different combinations of matter and under all different angles of incidence, we have simply to note the rule above states and the values of \( n \), which is much easier. The economical purpose here is unmistakable. In nature there is no law of refraction, only different cases of refraction.

(Mach 1960, 582)

The analogy to Wittgenstein’s account, once again minus Mach’s phenomenalism, should be clear here. We select the simplest logical system in which to represent the world given our local purpose. Looking forward, the analogy to Rudolf Carnap’s conception of logical form in the Aufbau, again minus the phenomenalism, should be equally clear.\(^{12}\)

Secondly, consider the relationship between Wittgenstein’s philosophy of space and time as the logical form of the fundamental symmetries and asymmetries of the physical laws and the accounts of geometry in terms of the motion of rigid bodies given by Helmholtz, and especially by Poincaré. Here the discussion in §8 of Chapter 5,

\(^{12}\) The connections between Wittgenstein’s general philosophical project and the philosophy of physics espoused by Heinrich Hertz are also striking and have been well explored by various scholars, including recently (Kjaergaard 2002; Preston 2008).
“Experiment and Geometry,” is particularly striking. In this section, Poincaré sketches an answer to the question, “When we say that space has three dimensions, what do we mean?” (Poincaré 1952, 84). Roughly, he answers this with the claim that the dimensionality of space is determined by the structure of the group of displacements, i.e. of rigid motions. What Wittgenstein points out at §6.36111 is that the definition of which rigid motions are possible must precede, or perhaps is equivalent to, a determination of the dimensionality of space. That is, in contrast to Poincaré, this determination is not an abstraction from experience of displacement, but a precondition for the experience of displacement. That is, our decision as to the allowable motions logically precedes our experience of them as rigid motions.13 In this way, Wittgenstein’s discussion of the relationship between the laws of physics and the structure of space is reminiscent of, among others, that of Hans Reichenbach in *The Philosophy of Space and Time* (Reichenbach 1958).

These two examples should serve to illustrate the significant extent to which *Tractatus* rests squarely within the mainstream of early analytic philosophy. However, the absence of the phenomenalism or empiricism also characteristic of early analytic philosophy signifies the extent to which Wittgenstein’s project runs counter to the mainstream as well. All four of the thinkers mentioned above—Mach, Poincaré, Carnap and Reichenbach—attempt to, in their own ways, ground their accounts of physical laws in experience and experiment. Wittgenstein’s ultimate conclusion is, however, that space, time, causality and the structural aspects of physical science more generally are fundamentally groundless. This is something that we do and to ask why we do this and

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13 For a detailed discussion of this tradition in the epistemology of geometry and the role of physical laws with it, see (DiSalle 2006).
not something else is the fundamental philosophical error.

And here, finally, we can see that Tractatus, as the therapeutic reading would have it, pushes us towards a life of practice in much the same way as Wittgenstein’s later work. However, it does so by developing and playing out what can only be called a traditional philosophical system; a technique clearly inimical to his later vision. In Tractatus, Wittgenstein clearly still believes that it is possible to delimit the boundaries of rule-governed representation from the inside; that the practice of conceiving particular rule-governed systems of representation is itself a constrained, or loosely rule-governed, activity whose structure can be illuminated by the picture theory of language. Precisely this conception that the practice of rule-governed representation in general operates under some collection of constraints similar to particular systems of representation is, at least one of, the presumptions that separates Tractatus from the later philosophy.

References


