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**Science and the Limits of Language:**  
An Interpretation of the  
*Tractatus Logico-Philosophicus*, 6.3-6.372.

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496807

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## Abstract

This thesis, "Science and the Limits of Language: An Interpretation of the *Tractatus Logico-Philosophicus*, 6.3-6.372" is a detailed examination, remark by remark, of Wittgenstein's section on science in the *Tractatus*. In general, much less attention has been devoted to Wittgenstein's remarks about science than to other sections in the *Tractatus*. I bring out some of the ways in which recent interpretations by commentators are in conflict with each other and argue that they fail to account for all of Wittgenstein's remarks in this section. I then show that Wittgenstein's remarks about science, both individually and as a whole, are very much in keeping with his remark in the Preface to the *Tractatus* that he is "draw[ing] a limit...to the expression of thoughts". On my view, the 6.3s is best seen not as an isolated section contributing solely to philosophy of science, but rather as an integral part of Wittgenstein's larger task of delineating the limits of the expression of thoughts.

Unless otherwise indicated, all references to the *Tractatus Logico-Philosophicus* are from C.K. Ogden's translation.

Unless otherwise indicated, when discussing the following authors I am referring to these particular works (for full reference, see the Bibliography):

G.E.M. Anscombe: *An Introduction to Wittgenstein's Tractatus*

M. Black: *A Companion to Wittgenstein's 'Tractatus'*

R.J. Fogelin: *Wittgenstein*

J.P. Griffin: *Wittgenstein's Logical Atomism*

P.M.S. Hacker: *Wittgenstein's Place in Twentieth-Century Analytic Philosophy*

B.F. McGuinness: "Philosophy of Science in the Tractatus"

H.O. Mounce: *Wittgenstein's Tractatus*

G.H.R. Parkinson: *Saying and Showing*

G.L. Proctor: "Scientific Laws and Scientific Objects in the 'Tractatus'"

B. Russell: *Problems of Philosophy*

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## I. *Introduction*

In the Preface of the *Tractatus Logico-Philosophicus*, Ludwig Wittgenstein tells us that his book will

...draw a limit to thinking, or rather--not to thinking, but to the expression of thoughts; for, in order to draw a limit to thinking we should have to be able to think both sides of this limit (we should therefore have to be able to think what cannot be thought).

The limit can, therefore, only be drawn in language and what lies on the other side of the limit will be simply nonsense (p. 27).

For Wittgenstein, the limits of thinking can only be drawn by showing the limits of the expression of thoughts, that is, through language. In language, which is our method of representation, "What can be said at all can be said clearly; and whereof one cannot speak thereof one must be silent" (p. 27). Wittgenstein's task, then, can be understood as one which involves showing us "what can be said clearly" and where "one must be silent". He will do this by providing us with a correct understanding of the logic of our language.

In what follows I discuss remarks 6.3 to 6.372 in the *Tractatus* (hereafter referred to as the 6.3s) bearing in mind Wittgenstein's remarks in his Preface. The 6.3s are usually considered to comprise Wittgenstein's discussion of science. The importance of a thorough investigation into the 6.3s cannot be overstated. At 4.11, Wittgenstein tells us that "The totality of true propositions is the total natural science (or the totality of the natural sciences)." But "Philosophy is not one of the natural sciences. (The word 'philosophy' must mean something which stands above or below, but not beside the natural sciences.)" (4.111). The role of philosophy, however, is to "limit the disputable sphere of natural science" (4.113). Contrary to claims of philosophers such as Bertrand Russell, philosophy is not a science in either its methodology or its results. Philosophy is, however, related to science, but only insofar as it shows its limits. In the 6.3s, then, we not only see that

philosophy is not science, but how it functions in terms of clarifying the limits of the natural sciences. For this reason, an investigation of the 6.3s affords greater insight into the *Tractatus* as a whole.

The amount of commentary on these sections is relatively small compared to the rest of the *Tractatus* (e.g. Wittgenstein's conception of logic, his 'picture theory of meaning', and his comments about metaphysics). Some of the best known commentators on the *Tractatus* say little about the 6.3s<sup>1</sup>. And those who do mention them, do not provide a systematic analysis of the remarks or focus mainly on the section as a contribution to philosophy of science as opposed to its role in the *Tractatus* as a whole<sup>2</sup>. In fact, the 6.3s are often thought to be inconsistent with the rest of the *Tractatus*; for example, Wittgenstein's net metaphor (6.341) has been charged with being inconsistent with the 'picture theory'<sup>3</sup>. Others argue that the 6.3s attend to "leftover" propositions which do not fit comfortably with his view of logic or, specifically, his 'picture theory'<sup>4</sup>. It is perhaps for this reason that the 6.3s have been dealt with separately from the *Tractatus* as a whole.

I think this is wrong. The 6.3s ought not to be read as an isolated section of the *Tractatus* nor as a mere appendage dealing with "leftover" problems, nor again as a section which contributes solely to philosophy of science. This is not to say that the 6.3s cannot be read in these ways, only to say that to read them this way is to fail to see their connection to the rest of the *Tractatus* and to

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<sup>1</sup> See, for example, P.M.S. Hacker's *Insight and Illusion* or G.E.M. Anscombe's *An Introduction to Wittgenstein's Tractatus*.

<sup>2</sup> The best of these is M. Black's *A Companion to Wittgenstein's Tractatus*. It contains a remark by remark analysis, though it remains somewhat fragmentary.

<sup>3</sup> Hacker, for example, in *Wittgenstein's Place in Twentieth-Century Analytic Philosophy* writes "it is not easy to see how its [the *Tractatus*'] schematic remarks about scientific theories fit into the overall picture of language delineated in the book" (p. 61). Black argues that it is inconsistent (p. 352). For an argument that it is consistent, see J.P. Griffin (pp. 102-111).

<sup>4</sup> See R.J. Fogelin (p. 90) and Anscombe (p. 79).

Wittgenstein's main task as he sets it out in his Preface. What I hope to show is that the 6.3s, while a self-contained section and while in some sense a contribution to philosophy of science, is more fruitfully read when its relation to the claim that the *Tractatus* is "drawing a limit to the expression of thoughts" is brought out (p. 27). Thus I hope to show that Wittgenstein's discussion in the 6.3s is not only consistent with his logic (and the picture theory), but also with the main aim of his book.

Wittgenstein's conception of the logic of our language shows us what "can be said clearly" and thereby shows the limits of the expression of thoughts (p. 27). This in turn shows that the problems of philosophy stem from "a misunderstanding of the logic of our language" (p. 27). When these aspects are applied to the 6.3s, it becomes clear that, first, the remarks in the 6.3s are in fact in keeping with Wittgenstein's conception of logic, and second, that the 6.3s contribute to his goal of showing that the problems of philosophy dissolve once we are given a correct understanding of the logic of our language. In these two senses the 6.3s are consistent with Wittgenstein's aim of drawing a limit to the expression of thoughts.

What is remarkable about the *Tractatus* is that with his conception of logic, Wittgenstein radically changes the ways in which we think of so many philosophical topics. This is evident in the 6.3s which take up only five pages in a book that is already not lengthy. In this short section the status of philosophical topics such as metaphysics, induction, causality, epistemology, the relative position of logic and mechanics, the laws of science, the true propositions of science, logical necessity versus contingency and the nature of explanation all flow from his conception of logic. Focusing on the 6.3s solely as a contribution to philosophy of science obscures many larger philosophical issues Wittgenstein is attending to in this section. Thus an investigation of the 6.3s not only affords greater insight into the *Tractatus* as a whole, but highlights the power, scope and

allure of Wittgenstein's conception of logic.

One proviso is in order. Showing that the remarks of the 6.3s flow from Wittgenstein's conception of logic and aid in showing that philosophical problems rest on a misunderstanding of the logic of our language does not mean that the remarks of the 6.3s are free from tension. While I shall argue that the 6.3s follow from his conception of the logic of our language, it is not clear that the conception of logic he promotes is consistent. Indeed, there is much debate over Wittgenstein's conception of the logic of our language, not to mention debates over the metaphysical or ontological implications, if any, of the *Tractatus*, e.g. the status of his 'simple objects', the nature of a 'fact', 'proposition', etc., and what he means by 'nonsense'<sup>5</sup>. What is more, Wittgenstein later gives up certain views which are often considered integral to the *Tractatus*, e.g. the independence thesis of elementary propositions<sup>6</sup>. While I shall point out certain tensions which arise in the 6.3s in this thesis, I shall not question the much broader issue of tensions which may exist in Wittgenstein's conception of logic, nor shall I speculate at this time as to whether or not tensions found in the 6.3s result from earlier inconsistencies in the *Tractatus* or are restricted to the 6.3s.

What follows is a detailed discussion of the 6.3s. Each remark is dealt with in order and the discussion is divided into sections providing background information as well as critical analyses of recent interpretations of the remarks.

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<sup>5</sup> For different interpretations on these varied topics, compare, for example, Hacker's *Insight and Illusion*, and C. Diamond's *The Realistic Spirit*.

<sup>6</sup> See Hacker, p. 35.

## II. *Logic and the Accidental*

Wittgenstein states that the *Tractatus* "deals with the problems of philosophy and shows...that the method of formulating these problems rests on a misunderstanding of the logic of our language" (p. 27). In order to grasp correctly what logic is, one must understand what belongs to it and what does not. To this end, Wittgenstein tells us that,

Logical research means the investigation of *all regularity* [*Gesetzmässigkeit*]. And outside logic all is accident (6.3).

In this remark, a distinction between the *logical* and the *accidental* is introduced and Wittgenstein tells us what logical research is. The domain of such research is the investigation of "all regularity", while the sphere of accidental research, which does not investigate "all regularity", does not belong to logic.

We know from 6.1 that "The propositions of logic are tautologies" and from 6.11 that "The propositions of logic therefore say nothing. (They are the analytical propositions)". Thus, inasmuch as "the investigation of *all regularity*" is logical research, it concerns tautologies which say nothing and are analytic 'propositions'<sup>7</sup>. Significant propositions, those which can be true or false and are not tautologies, are accidental, i.e. contingent.

It should be noted here that there is only one appearance of the word "analytic" in the *Tractatus*. Unlike a philosopher such as Immanuel Kant, who gives an explicit definition of analytic as a) statements in which the predicate is contained in the subject, b) statements the opposite of

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<sup>7</sup> It is somewhat confusing that Wittgenstein uses the term 'analytic' with 'propositions', since on a close reading, 'proposition' simply means 'significant proposition' and there are, strictly speaking, no other kinds of propositions. 'Non-significant propositions' (such as those of logic or mathematics) are either tautologies (and not propositions at all) or pseudo-propositions (also not propositions) (6.1 & 6.2). But Wittgenstein does not seem concerned about using the term 'proposition' in this loose manner. As we shall see at 6.34, he again uses the term 'proposition' when speaking of the law of causation, though he clearly states that it cannot be a significant proposition.

which yield a contradiction and c) statements that are uninformative, Wittgenstein does not define "analytic". It is clear, however, given his claim that logical propositions are tautologous, senseless and provide no information, that his use of the word "analytic" can be understood as "uninformative". (See, for example, 4.461: "I know nothing about the weather, when I know that it rains or does not rain".) Since Wittgenstein uses the word "analytic" but once and does not use the word "synthetic" at all, the traditional analytic/synthetic distinction is perhaps better understood as a distinction between "uninformative" and "informative" statements when reading the *Tractatus*.

Wittgenstein's remark at 6.3 is very much in keeping with his aim to draw the limit of the expression of thoughts. "What can be said at all" are significant propositions belonging, as we have seen, to the accidental. Tautologies, on the other hand, are the "analytical propositions" which "say nothing" (6.11) and are not informative.

But what exactly does Wittgenstein mean when he says that logical research is the investigation of "all regularity"? Usually, when we think of "all regularity", we think of laws of some sort, of what *must* be of necessity. For Wittgenstein, necessary laws are purely logical. But what about laws that seem not to be purely logical, but partly contingent, such as the law of induction or the law of causality? Indeed, what about physical laws which seem not to be logical at all<sup>8</sup>? What status do they have? In what follows, we can expect Wittgenstein to tell us just that; that is, which "laws" belong to the logical and which belong to the accidental. In this way, he will be contributing to his task of telling us where "one must be silent" and what "can be said clearly" (p. 27).

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<sup>8</sup> The relationship between laws of nature and physical laws is discussed later.

### ***III. The so-called Law of Induction, Epistemology and the A Priori***

The first law Wittgenstein looks at is the law of induction. This law is best understood as legitimating inferences that the future will resemble the past, that, for example, the sun must rise tomorrow given that it has always risen in the past. Induction is considered to be one of the main methods used in science – a scientist gathers information (data) and then infers generalizations from it, making what is called an inductive inference. Unlike deduction, induction moves from a finite number of observations (the sun having risen so many times in the past) to a possible future observation (the sun will rise tomorrow) or a larger, general or law-like conclusion (the sun will always rise).

The problem philosophers have faced is that it is quite unclear how a finite number of observations can lead to claims about possible future observations. There is no *logically* valid basis for concluding that the future will resemble the past since it is logically possible for the premises of an inductive argument to be true and its conclusion false. Philosophical arguments which attempt to justify the law of induction based on the fact that induction has worked in the past fall prey to the objection that this defence rests on an inductive argument and therefore is circular. Arguments which attempt to justify induction by redefining the conclusions as 'probable' as opposed to 'certain' still face the problem of accounting for *how* a finite number of observations in the past can tell us the probability of a *future* occurrence. As Russell points out, "We have experiences of past futures, but not of future futures, and the question is: Will future futures resemble past futures? This question is not to be answered by an argument which starts from past futures alone" (Russell, p. 36). Indeed, if it did, it would beg the question at issue since it presupposes induction.

It is not just because arguments which attempt to justify inductive inferences are circular that

the status of the law of induction is an issue. It is also because whether the future resembles the past seems to be an empirical question; namely, whether or not nature is uniform. As Russell writes,

The problem we have to discuss is whether there is any reason for believing in what is called 'the uniformity of nature'. The belief in the uniformity of nature is the belief that everything that has happened or will happen is an instance of some general law to which there are *no* exceptions (Russell, p. 35).

If there are "*no* exceptions" to a law, one might think that such a law is an expression of *regularity* (which Wittgenstein tells us is logical research). But this sort of a law also seems to be empirical, and therefore informative, to the degree that its truth depends on how the world is and its opposite (nature not being uniform) does not lead to a contradiction as is the case with analytical statements (see also Section II).

Given that inductive inferences rest on a principle which clearly does not have the character of logical law (such as "If A then A") and seems further to be based on some matter of fact, for example, nature being uniform, it is not surprising that at 6.31 Wittgenstein writes,

The so-called law of induction [*Gesetz der Induktion*] cannot in any case be a logical law, for it is obviously a significant proposition [*sinnvoller Satz*].--And therefore it cannot be a law a priori [*Gesetz a priori*] either<sup>9</sup>.

If most philosophers agree that the law of induction is not something purely logical, but has an empirical basis, then Wittgenstein's remark seems uncontroversial. But it is controversial. It can be seen as undercutting the notion of informative, or synthetic, *a priori* truths, of which the law of induction is sometimes viewed as an example. What is more, in clarifying the status of *a priori* truths, Wittgenstein can be seen as contributing to his understanding of the status of logic in general, since what he means by a 'proposition' of logic versus a significant proposition will be made more

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<sup>9</sup> Wittgenstein had this view of the law of induction as early as 1915. See *Notebooks 1914-1916*. 2nd edition, p. 46.

clear. Russell's view of the law of induction, as well as its role in his theory of knowledge, is a good example of what Wittgenstein's remark at 6.31 is directed against.

In *The Problems of Philosophy*, which we know Wittgenstein read before drafting the *Tractatus*, Russell discusses the law of induction. For Russell, any adequate theory of knowledge must provide some justification for our inductive inferences; that is, it must give us good reasons which justify our belief that the sun will rise tomorrow as opposed to our belief being "a mere blind outcome of past experiences" (Russell, p. 31). For Wittgenstein, however, "[t]he theory of knowledge is the philosophy of psychology" and "[p]sychology is no nearer related to philosophy than is any other natural science" (4.1121). As G.E.M. Anscombe writes, "Wittgenstein evidently did not think that epistemology had any bearing on his subject matter" (Anscombe, p. 27). Epistemology, or the theory of knowledge, which Wittgenstein excludes from philosophy can be understood as "the philosophy of sensation, perception, imagination, and, generally, of 'experience'" (Anscombe, p. 152). Anscombe notes that Wittgenstein excludes epistemology from philosophy "simply by cutting it dead; by doing none, and concentrating on the philosophy of logic"<sup>10</sup> (Anscombe, p. 152). For Wittgenstein, then, how we come to know "regularities" or "laws" is irrelevant to logic. In particular, psychology, according to Wittgenstein can have no bearing on logic since logic is concerned with what *must* be of *necessity* and therefore it cannot be otherwise, regardless of any philosophy of "sensation, perception, imagination [or] 'experience'", which

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<sup>10</sup> Elsewhere Anscombe claims that Wittgenstein did not successfully exclude epistemology from the *Tractatus*. She writes, ...at the time when he wrote the *Tractatus*, Wittgenstein pretended that epistemology had nothing to do with the foundations of logic and the theory of meaning, with which he was concerned. The passage about the 'elucidation' of names, where he says that one must be 'acquainted' with their objects, gives him the lie (Anscombe, p. 28).

'Acquaintance' is usually understood as an epistemological notion (Russell's 'knowledge by acquaintance', for example). Thus if one must be 'acquainted' with the objects which names name, then Wittgenstein has not, according to Anscombe, excluded epistemology. It is not clear to me what Wittgenstein had in mind when he stated that we must be 'acquainted' with objects. For my purposes, however, it is sufficient to state that Wittgenstein intended to exclude epistemology.

Wittgenstein sees as comprising contingent propositions. Epistemology is of no service to a logical investigation, which Wittgenstein is engaged in, since it can neither legitimate nor refute it.

Given Russell's and Wittgenstein's views of philosophy and epistemology, it is not surprising that Wittgenstein has very different views from Russell regarding the role of synthetic *a priori* truths which form an important part of Russell's theory of knowledge. Russell defines the law of induction for the justification of a general law (such as a law of motion) in the following way:

(a) The greater the number of cases in which a thing of the sort A has been found associated with a thing of the sort B, the more probable it is (if no cases of failure of association are known) that A is always associated with B;

(b) Under the same circumstances, a sufficient number of cases of the association of A with B will make it nearly certain that A is always associated with B, and will make this general law approach certainty without limit (Russell, p. 37).

Russell takes this principle to justify the probability of the truth of a general law (such as a law of motion). The kind of induction Russell is looking at is from samples in the past to a general law. For him, this principle is self-evident and *a priori*, yet not analytic. What is more, because of its self-evident status, Russell sees the law of induction as a logical principle (Russell, p. 64). Thus while Russell might agree with Wittgenstein that the law of induction is not analytic, it nevertheless has the status, contrary to Wittgenstein's remark at 6.31, of being a logical principle which is self-evident and *a priori*.

The principle of induction is not analytic for Russell, since its opposite does not yield a contradiction and it is not the case that its "predicate is obtained by merely analysing the subject" (Russell, p. 46). Yet at the same time the principle of induction can be neither proved nor disproved by experience. First, any argument which argues from past experience to future experience cannot be justified by experience alone and requires the inductive principle. And second, since the associations between A and B in Russell's definition are of a *probable* (as opposed to certain) nature,

the fact "that things often fail to fulfil our expectations is no evidence that our expectation will not *probably* be fulfilled in a given case or a given class of cases" (Russell, p. 37). Thus, the lack of fulfilment of one of our expectations would not falsify the principle.

Although the principle of induction can be neither proved nor disproved by experience, it is nevertheless self-evident. We come to know it by experiencing particular instances from which we 'see' its self-evident character (Russell, p. 65). For Russell, who was engaged in logicism, the program of reducing mathematics to logic, self-evidence plays a crucial role. Not only can mathematics be reduced to logic, but logic has as its foundations a number of self-evident principles (or axioms). For Wittgenstein, however, self-evidence has nothing to do with logic and there is no need to provide a foundation for logic in terms of logical axioms, self-evident or otherwise<sup>11</sup>. This is so because of Wittgenstein's general view of logical propositions as tautologies. On this view, all logical propositions are the same, that is, they are tautologous. Thus there are no logical propositions which are more basic or primitive than others, such as Russell's logical principles. In addition, there is no need for a criterion of self-evidence in order to recognize a logical proposition since all that is needed is to recognize that it is a tautology (6.1271)<sup>12</sup>. What is more, Laws of Inference used to justify conclusions in logic are superfluous since the propositions themselves can be seen to justify the inference (5.132) (see also Section XIV for a more detailed explanation). Thus, on Wittgenstein's view, there not only cannot be any primitive logical principles, self-evident or otherwise, there is no need for them.

On Russell's conception, the law of induction is a self-evident law *about the world*. It tells

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<sup>11</sup> There is also no need to reduce mathematics to logic since on Wittgenstein's view, mathematics is a logical method and the propositions of mathematics are pseudo-propositions (6.2).

<sup>12</sup> See also 5.4731.

us that the world is such a way that "the greater the number of cases in which a thing of the sort A has been found associated with a thing of the sort B, the more probable it is (if no cases of failure of association are known) that A is always associated with B" (Russell, p. 37). In this sense, the law of induction provides us with information about the world. It is informative, or synthetic *a priori*.

This view of the status of the law of induction, as well as the role of epistemology as it relates to logic is exactly what Wittgenstein wants to "cut dead" from his work in the *Tractatus*. While Wittgenstein and Russell can be viewed as disagreeing as to the nature of self-evidence, they also disagree regarding the status of the law of induction as *a priori*. Since the law of induction is "obviously a significant proposition" for Wittgenstein and not a logical law it therefore "cannot be a law *a priori* either" (6.31). Thus while Russell can be seen as differentiating between analytic and *a priori* insofar as the former is uninformative while the latter may be informative and about the world (synthetic), Wittgenstein can be seen as viewing both the analytic and the *a priori* as uninformative.

Wittgenstein would argue that Russell's view of the principle of induction as an *a priori* truth comes from conflating logical questions (e.g., whether or not the law of induction is a logical law) with epistemological questions (e.g., "What can we know by experience?"). The result is that epistemological issues, such as what can be known by experience, determine the status of principles instead of logical investigation. With a correct understanding of the logic of our language, it becomes clear that if the principle of induction is *not* a logical law, it must be a significant proposition, there being no other alternative on Wittgenstein's view<sup>13</sup>. That we, as Russell suggests, come to 'see' the principle of induction through experience has no bearing on its status, since this is

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<sup>13</sup> Except in the case of the propositions of mathematics, which Wittgenstein calls pseudo-propositions.

an epistemological issue which has nothing to do with the philosophy of logic. When epistemological questions are set aside, as by Wittgenstein, they no longer play a role in determining or supporting one's view of the law of induction. A logical investigation will show that the law of induction is not a logical law since it involves no necessity (the truth of the premises of an inductive argument do not guarantee the truth of its conclusion); hence it is also not *a priori* and certainly cannot be synthetic *a priori*.

Wittgenstein can be seen as clearing up the ground upon which philosophical problems arise. He is interested in the role of logic and the status of logical 'propositions'. By separating logical 'propositions' from significant ones and excluding epistemology, the status of propositions as either logical (tautologous) or significant (capable of being either true or false) becomes clear. Since induction is not a logical "law", it has nothing to do with Wittgenstein's exploration of "all regularity". As a significant proposition, the so-called law of induction cannot be synthetic *a priori* since what is *a priori* is part of logic and cannot be informative. But Wittgenstein's exclusion of the *a priori* as informative is not arbitrary. It stems from his view that what is *a priori* cannot be about the world; that it cannot be synthetic. While logic is *a priori* (5.4731), it says nothing about the world since tautologies are empty and convey no information (4.461). For a proposition to be capable of describing the world, it must be capable of being true or false. But if this is the case, it is a significant proposition and belongs to the domain of the accidental, and hence cannot be *a priori*. It is in this way that, as Anscombe writes, Wittgenstein can be seen as trying to "break the dictatorial control over the rest of philosophy that had long been exercised by what is called theory of knowledge" (Anscombe, p. 152). He manages to do this by showing that the problems of philosophy, in this case those surrounding the law of induction, arise from "a misunderstanding of

the logic of our language"; that is, a misunderstanding of what belongs to logical research and what is accidental (p. 27).

Although it is clear Wittgenstein thinks that the "so-called law of induction" is a significant proposition and is neither a logical law nor an *a priori* law (nor even a law), he has yet to explain exactly how one ought to conceive of it as a significant proposition. Wittgenstein takes this up at 6.363 to 6.36311 where he resumes his discussion of induction (see Section XIV).

#### IV. *The Law of Causality, Forms and Pictures*

After stating the status of the law of induction, Wittgenstein discusses the law of causality. The law of causality is usually thought of as expressing the idea that every event has a cause or the occurrence of one event causes, or necessitates, the occurrence of a second. Causality is related to induction insofar as the idea that every event has a cause is associated with the notion of the uniformity of nature (see the discussion of 6.31 above). In the history of philosophy, from the Greeks to the present, the law of causality has been expressed in many ways and has been used in many, often controversial, arguments. Initially, the law was expressed as "nothing can come from nothing". A corollary of this is that everything that is must have a cause. It is the law of causality that is at issue in most debates about the validity of cosmological arguments, debates that are still alive and well. Advances in both quantum mechanics and Big Bang Theory have provided what seems to some as evidence that the law of causality is false and fresh attempts have been made to show that the law of causality need not apply to the coming into being of the universe. On this view, it is thought to be possible to use scientific theories to show that the universe is uncaused<sup>14</sup>.

For Wittgenstein the problem of whether or not the law of causality is true or false arises from a "misunderstanding of the logic of our language" (p. 27). I think his treatment of causality is in keeping with his remarks in the Preface in that he is continuing his task of drawing the limits of the expression of thoughts. Once a proper conception of logic is given, the issue of the truth or falsity of the law of causality dissolves.

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<sup>14</sup> See, for example, the debate between Q. Smith ("The Uncaused Beginning of the Universe", *Philosophy of Science*, 55 (1988) and "Can Everything Come to Be Without a Cause?", *Dialogue*, 33 (1994)) and T.D. Sullivan ("Coming To Be Without a Cause", *Philosophy of Science*, 65 (1990); "On the Alleged Causeless Beginning of the Universe: A reply to Quentin Smith", *Dialogue*, 33 (1994)).

At 6.32 Wittgenstein says,

The law of causality is not a law, but the form of a law.

Thus, like the so-called law of induction, the law of causality (*Kausalitätsgesetz*) is not a law for Wittgenstein. But unlike the so-called law of induction, the law of causality is not a significant proposition, but rather "the form of a law". Since it is not a significant proposition, it is not something that can be true or false. This view of the law of causality is not arbitrary, but can be traced back to Wittgenstein's notion of picturing and his truth-functional view of propositions.

At 2.033 and 2.15, Wittgenstein likens the form of a proposition to the *possibility* of its structure<sup>15</sup>. After telling us that atomic facts are made up of objects which are configured in a particular way (2.0272-2.032), Wittgenstein states that "The form is the possibility of the structure" (2.033). The "structure" of an atomic fact is the particular way in which its objects "hang together" (2.032), that is, the way in which the objects happen to be configured. The "form" of the atomic fact, then, is the *possibility* of those objects being configured in particular ways. Thus the "form" of an atomic fact is the possibility of the structure that it may have. Just as with atomic facts, the

...connexion of the elements of the picture is called its structure, and the possibility of this structure is called the form of representation of the picture (2.15).

The elements of the picture relate to form the same way as the objects of an atomic fact do. The picture's elements are configured in a certain way, just like objects, and this configuration is the picture's structure. The *possibility* of that structure, or configuration, is the "form of the representation of the picture".

Elementary propositions 'picture' possible atomic facts, the former being a concatenation of

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<sup>15</sup> See Black (p. 345), who also interprets "form" as "possibility" and applies it to remark 6.32.

names which name the objects in the latter (4.21 and 4.22). The form of an elementary proposition, then, which pictures an atomic fact, is the

...the possibility that the things [objects] are combined with one another as are the elements of the picture [or in this case, the names in an elementary proposition] (2.151).

We see here that form is the possibility of a particular structure and that with the elementary proposition that means the possibility that the objects in an atomic fact are combined in the same way as the names are in an elementary proposition.

As the "form of a law", the "law of causality" cannot be a proposition at all. Just as in the case of the form of a proposition, the form of a law is no more (and no less) than a possibility of a particular structure. While every significant proposition has a form in the sense that it pictures a possible configuration of objects, no form can be expressed by a proposition. This is because propositions are pictures and the limits of what a picture can represent and what a proposition can represent are the same. Thus while the "picture can represent every reality whose form it has" (2.171) and "propositions can represent the whole reality" (4.12), neither pictures nor propositions (which are pictures) can represent their form of representation. Regarding pictures, Wittgenstein writes,

The picture, however, cannot represent its form of representation; it shows it forth (2.172).

To represent its form of representation a picture would have to "place itself outside of its form of representation" (2.174). If one thinks of a painting of a tree as an example of a picture, it is clear that one cannot represent how the picture represents. Even if one were to paint a second picture of the artist painting a painting of the tree, one still has not represented how this second painting represents. Just as the artist painting the painting cannot be represented in the painting, so too the form of

representation of a picture cannot be represented by the picture.

Wittgenstein makes the same point regarding propositions that are pictures. He writes,

Propositions...cannot represent what they must have in common with reality in order to be able to represent it--the logical form (4.12).

They cannot since

[t]o be able to represent the logical form, we should have to be able to put ourselves with the propositions outside logic, that is outside the world (4.12).

Yet it is clear that we cannot represent logic from outside it -- this would be like attempting to paint a picture which is not a picture at all since it does not conform to the conditions that make picturing possible. Thus, as the form of a law, the "law of causality" cannot in any way be a proposition since form cannot be represented by a proposition.

Thus far, I have argued that the law of causality, as the form of a law cannot be a proposition and that the limits of what can be expressed by a proposition follow from Wittgenstein's notion of picturing and his view of the proposition as a picture. Central to a proper understanding of the logic of our language, which dissolves philosophical problems, is an appreciation of the impossibility of propositions construed as pictures being capable of picturing their method of representation; that is, their logical form. In treating the law of causality as a proposition (which can be true or false) philosophers make the mistake of trying to represent the form of a proposition and attempt to "put [themselves] with the propositions outside logic, that is outside the world" (4.12). They do this because they do not understand the logic of our language and incorrectly understand the nature of the proposition. Also, since a correct conception of logic involves seeing propositions as truth-functions, Wittgenstein's truth-functional view of propositions will similarly show the limits of what can be expressed by a proposition, just as his view of picturing does.

Wittgenstein takes the "Law of Causality" (*Kausalitätsgesetz*) to be a class name. At 6.321

he writes,

"Law of Causality" is a class name. And as in mechanics there are, for instance, minimum laws, such as that of least action, so in physics there are causal laws, laws of the causality form.

Laws which share a particular form can be seen as belonging to a certain class of laws. In terms of minimum laws (*MinimumGesetze*), which belong to mechanics, Black suggests that Wittgenstein may have been thinking of laws such as Maupertuis' law of least action (1747) and Hamilton's Principle (1824) (Black, p. 345-6). The former states that phenomena such as light follows the path of least action, while the latter can be seen as a redefinition of Maupertuis' law in terms of a function (called a 'Hamiltonian') (*Dictionary of History of Science*, p. 255). In terms of causal laws (*Kausalitätsgesetze*), which belong to physics, Black suggests that Wittgenstein may have been thinking of laws in physics which are expressed as differential equations (Black, p. 345). Differential equations are used, for example, in theories of heat<sup>16</sup>.

When Wittgenstein's notion of 'class names' is compared with 'formal concepts', the law of causality can be seen as having a status similar to a *formal concept*. Formal concepts cannot sensibly be presented by a function any more than the form of a proposition (or law) can be presented by a proposition. It is in this way that Wittgenstein's view of the proposition as a truth-function also limits what can be expressed by a proposition as does picturing. Wittgenstein writes,

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<sup>16</sup> For example, when heat is conducted down a metal bar, the temperature (defined as:  $u(x, t)$ ) at time  $t$  at a distance  $x$  from one end satisfies the following differential equation:

$$\frac{\delta u}{\delta t} = k \frac{\delta^2 u}{\delta x^2}$$

*The Encyclopedia of Physics*, p. 211.

That anything falls under a formal concept as an object belonging to it, cannot be expressed by a proposition. But it is shown in the symbol for the object itself. (The name shows that it signifies an object, the numerical sign that it signifies a number, etc.)

Formal concepts cannot, like proper concepts, be presented by a function.

For their characteristics, the formal properties, are not expressed by functions (4.126).

A function can represent what falls under a particular formal concept, but not the formal concept itself. Particular objects such as 'Socrates', for example, can be represented by a function, but not formal concepts, such as 'object'<sup>17</sup>. The confusion about what a proposition can assert arises because proper concepts are confused with formal concepts in the function. The formal properties of proper concepts cannot be expressed *by* functions as proper concepts are (4.126). This is so because the formal properties which the proper concepts share are presented by variables *in* functions and thus cannot be expressed by them (4.1272).

What is the variable in a function? The variable is a sign for the formal concept in the function and "presents a constant form, which all its values possess, and which can be conceived as a formal property of these values" (4.1271). For example, "P(x)" stands for a function where "P" is the predicate "is portly" and "x" stands for the variable which presents a constant form of all of its values, e.g., "*a* is portly", "*b* is portly", etc. The variable *x* in this example can be conceived of as a formal property of its values *a*, *b*, *c*, etc. It is a sign for the formal concept in the function; that is, *x* stands for what is common to all its instances. But one cannot express a formal concept by a function. This would be to mistake what is *presented by a variable* (the formal concept, in this example 'x') in the function with *the value of the variable* (a proper concept word, in this example

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<sup>17</sup> Other examples of formal concepts are 'number', 'fact', 'proposition', 'function' and 'complex'. For a clear discussion of formal concepts and proper concepts, see Anscombe, p. 82 and pp. 123-124, where Wittgenstein's view is contrasted with Frege's.

'a', 'b', 'c', etc., which stand for people). In other words, one would be attempting to "introduce both, the objects which fall under a formal concept *and* the formal concept itself as primitive ideas" (4.12721). And likewise for the law of causality and class names: One cannot introduce both the laws which fall under the class name of "Law of Causality" *and* the Law of Causality itself as primitive ideas. One would be confusing the name of a particular class of laws with an instance of that class. This would be the same as mistakenly treating the formal concept 'object' as a particular object, 'Socrates'. Thus on Wittgenstein's view, it is senseless to speak of the existence of a law of causality just as it is senseless to ask about the existence of a formal concept (4.1274).

What is more, "The formal concept is already given with an object [or law which the law of causality is the form] which falls under it" (4.12721). Each law, and each object, carries with it its form, so it makes no sense to treat its form as if it were itself a law, or an object. While a picture of Socrates shows that Socrates is an object, we cannot have a picture of what is common to all such objects, i.e., the formal concept 'object'. Similarly, while Maupertuis' law and Hamilton's Principle bring with them their form which shows that they all belong to a certain class, it makes no sense to treat what is common to them (a particular form) as something which is itself a law and a member of that class.

Wittgenstein's treatment of form, first in terms of pictures and then in terms of propositions, squares perfectly with his view of the proposition as a truth-function. A picture, a proposition (which is a picture) and a truth-function (which is a proposition) cannot represent their method of representation (their form). Attempts to treat the law of causality as a particular causal law likewise rest on a misunderstanding of the logic of our language; first, a misunderstanding of the nature of the proposition as a picture and the limits of representation (logical form cannot be represented), and

second, a misunderstanding of the proposition as a truth-function and the differences between formal concepts and proper concepts. With a correct understanding of the logic of our language, Wittgenstein makes clear what we must be silent about (logical form) and how we can speak clearly (with significant propositions).

But what is the status of the laws in physics of which the law of causality is the form? It is tempting to conclude that particular causal laws are significant propositions since it is only the form of a law, or class of laws, which cannot be expressed as a proposition or in a function (e.g. the law of causality). Any conclusions at this point, however, would be premature since Wittgenstein has not said anything about the status of the laws of science. Thus far, he has only told us that the so-called law of induction is a significant proposition and that the law of causality can in no way be a significant proposition since it is the form of a law. The relationship between logic and the laws of science is discussed in more detail from 6.341 to 6.3432 (see Sections VI and VIII).

## V. A Priori Laws

At 6.31 Wittgenstein told us that the so-called law of induction cannot be an *a priori* law nor a logical law since it is a significant proposition. This, as we saw, is related to Wittgenstein's task of cutting dead epistemology and the idea that there are informative *a priori* truths. In the next remark, Wittgenstein again makes clear what belongs to the logical and what belongs to the accidental with regard to the laws of science. He writes,

Men had indeed an idea that there must be a "law of least action", before they knew exactly how it ran. (Here, as always, the *a priori* certain proves to be something purely logical.) (6.3211)

To say that we know that there *must* be a law of least action (*Gesetz der kleinsten Wirkung*) before we know its exact formulation is to make an *a priori* "statement". Yet it appears to be an informative statement since it seems to state that the world must be a certain way, i.e. that the world is such that things follow the path of least action (light, for example). But this is not the case at all. "[A]s always," Wittgenstein tells us, "the *a priori* certain proves to be something purely logical." That we know there *must* be a law of least action is to say no more, and no less, than that a law of least action is *thinkable*<sup>18</sup>. The possibility of the formulation of a law of least action, such as Maupertuis' or Hamilton's, is no more than a logical possibility which is not about the world at all. Again, contrary to views such as Russell's, Wittgenstein's conception of the *a priori* can in no way be informative or part of the accidental, since it is purely logical (see Section III).

Black argues that Wittgenstein's use of the word "logical" in this remark is not the same as it is earlier in the book. He writes,

At 6.124*gh*, logical propositions were said to be generated inexorably by the rules of

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<sup>18</sup> See also 5.4731: "That logic is *a priori* consists in the fact that we *cannot* think illogically".

logical syntax. In the present context, the relevant syntax must be that which governs the special 'language' of science, and W. is here emphasizing the *variability* of scientific systems of representation. We might say: what is '*a priori* certain' is the *conceivability*, the possibility, of laws of the causal sort (Black, p. 346).

I think that Black's introduction of the syntax of the special 'language' of science is premature and misses the aim of Wittgenstein's remarks. Assuming that Wittgenstein is only dealing with science, or the philosophy of science, in the 6.3s might lead one to a view such as Black's. But this narrow conception of the 6.3s, and in particular 6.124, misses the larger scope of them, in particular their relationship to metaphysics and *a priori* truths.

Black's point is that previously Wittgenstein remarks that the 'propositions' of logic are tautologies which arise from the syntax of language. He may think that because Wittgenstein mentions the law of least action his remark must be about the logical syntax of the special languages of the sciences. Or perhaps Black believes that if the *a priori* certain is "purely logical", then statements about such a possibility will be either empty tautologies or misformulated propositions. Since Wittgenstein's remark seems only to tell us that certain laws are possible, he sees this as stressing the variability of scientific systems of representation.

It seems right that Wittgenstein's remark is meant to tell us that "what is '*a priori* certain' is the *conceivability*, the possibility of laws of the causal sort" (Black, p. 346) so long as we keep in mind that for Wittgenstein what is *a priori* has to do with logical rather than epistemological possibility. However, if one connects this remark with Wittgenstein's aim of showing the limit to the expression of thoughts by showing us what belongs to logic, and therefore says nothing, and what does not, and therefore does say something, then his remark cuts much deeper and is not merely introduced to stress the variability of scientific systems of representation. We saw earlier that Wittgenstein is attempting to get clear on the logic of our language, which includes ridding

philosophy of epistemology and the view that there can be informative *a priori* truths. The fact that we *can* replace "law of least action" with "causal law" in 6.3211 (as Black inadvertently does) shows just how far-reaching Wittgenstein's remark is and how it is to do with language, or representation, in general. The role of the law of causality in philosophy is in no way restricted to philosophy of science as the law of least action seems to be. The fact that Wittgenstein's point about the law of least action applies also to the law of causality shows, I think, that his real interest (and target) is metaphysical conceptions of laws stemming from a misunderstanding of the logic of our language (any language). His point is that what is "a priori certain" is purely logical (understood in this case as a logical possibility) and what is purely logical is empty and uninformative.

Philosophers have often argued that the law of causality is one of the synthetic *a priori* truths that comprise philosophical knowledge. In distinguishing Kant's view from Wittgenstein's, P.M.S. Hacker writes,

Kant's transcendental arguments constitute attempts to derive synthetic a priori propositions which are true descriptions of the phenomenal world (hence synthetic), but which hold necessarily of it and can be known in advance of experience. The primary example of such a synthetic a priori truth is the principle that every event has a cause [the Law of Causality] (Hacker, *Insight and Illusion*, p. 211).

Hacker points out that for Wittgenstein, philosophy is not about discovering or justifying synthetic *a priori* truths. Instead,

A philosophical work consists essentially of elucidations.  
The result of philosophy is not a number of "philosophical propositions", but to make propositions clear (4.112).

Wittgenstein's remark at 6.3211, like 6.31 which discusses induction, is an attempt to get clear about what belongs to the logical and what belongs to the accidental. Wittgenstein's point is that logic (which, for him, is philosophy *proper*) tells us what is possible, but that is all it tells us.

Philosophers have not understood the nature of the *a priori* certain; they have misunderstood that what is *a priori* certain is *purely logical* (*rein Logisches*) and is in no way informative or about the world. At this point, then, Wittgenstein is engaged in the task of showing the limits of the expression of thoughts. He is not, in this remark anyway, merely "emphasizing the *variability* of scientific systems of representation" as Black suggests (Black, p. 346).

Taking logic to provide us with possibilities, Wittgenstein next observes,

We do not *believe* a priori in a law of conservation, but we *know* a priori the possibility of a logical form (6.33).

Just as having an idea that there must be a "law of least action" is an *a priori* certainty, we similarly know *a priori* the possibility of a law of conservation (such as a law of conservation of energy or of conservation of momentum)<sup>19</sup>. But since we know this on purely logical grounds (the possibility of a logical form), and logic tells us nothing about the world, we do not *believe* a priori in a law of conservation. Reasons for believing in something are quite separate from knowing that something is possible. If we think of the minimum laws, such as Maupertuis' Law of Least Action and Hamilton's Principle, Wittgenstein's point is clear. We know that both laws are *possible* but this is no reason for *believing* in either of them, let alone one over the other. Whatever reasons we may have for believing in something cannot be given to us by logic. What is *a priori* provides us with no information about the world (i.e. is not synthetic) and hence is not something which has anything to do with belief. On this view, *a priori* knowledge is really no knowledge at all, since it is logical and therefore empty.

Wittgenstein's next remark is continuous with the previous ones in that it elaborates on the

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<sup>19</sup> It should be made clear that, for Wittgenstein, to know a logical possibility is strictly speaking not to know anything since logic consists of empty tautologies. Thus there is no "third realm" of logical possibilities (Hacker, p. 33).

relationship between forms of laws, laws and the *a priori*. In this remark, for the first time, Wittgenstein mentions the propositions of science, which we know are significant propositions (4.11). He writes,

All propositions [*Sätze*]<sup>20</sup>, such as the law of causation [*Satz vom Grunde*]<sup>21</sup>, the law of continuity in nature, the law of least expenditure in nature, etc., etc., all these are a priori intuitions of possible forms of the propositions of science [*Sätze der Wissenschaft*] (6.34).

Only the propositions of science are significant propositions, that is, propositions which can be true or false (4.11). The propositions of logic are tautologous, and as such, say nothing; they are senseless. The law of causation (or causality) is the form, or the class name, of causal laws (6.32 and 6.321). We know the possibility of laws of the form of least action (minimum laws) before knowing exactly how they run (6.3211). Similarly, we know the possibilities of laws of the causal form before knowing exactly how they run. Expanding on this, Wittgenstein now includes the law of continuity in nature and the law of least expenditure in nature along with the law of causality. These laws are "a priori intuitions of possible forms of the propositions of science". This is not to say that there is a faculty of intuition which Wittgenstein is alluding to (Black, p. 346)<sup>22</sup>. Rather, his aim is to clarify the status of these "laws" and relate them to science. The laws of causality, of continuity in nature and of least expenditure in nature are the *possible forms* of propositions of science, but are

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<sup>20</sup> This first use of the word "proposition" ("all propositions") should not be thought of as implying that the law of causation (or causality), etc., is a significant proposition. The German word "Satz" can be translated as "proposition" or "principle". In this remark, a translation of Satz as "principle" would have been better.

<sup>21</sup> Ogden translates "Satz vom Grunde" as "law of causation". A better rendering would be "Principle of Sufficient Reason". "Kausalitätsgesetz" by contrast, is translated as "law of causality" (as opposed to causation). Perhaps Ogden was attempting to capture the distinction by using "causation" instead of "causality", however, Wittgenstein seems to have used the terms "law of causality" and "Principle of Sufficient Reason" interchangeably. In a letter to Russell dated January, 1914, Wittgenstein writes the German "Satz vom zureichenden Grunde" and translates it himself in parentheses in English as "Law of causality" (*Letters to Russell, Keynes, and Moore*, p. 46).

<sup>22</sup> Kant's term for "intuition" is "Anschauung". The word Wittgenstein uses is "Einsicht", which can also be translated as "insight".

not themselves propositions of science. Most importantly, as *a priori*, these laws can in no way be informative.

The question of the status of the actual laws of science crops up here as it did in the discussion of 6.321. Wittgenstein has told us that the fact that a particular law of a certain form in mechanics, say Hamilton's Principle, is possible is no reason for *believing* it. But one would expect that belief would only be applicable to significant propositions, propositions which can be true or false. It makes no sense to believe in logic since logic is not something which can be true or false -- it is analytical and *a priori* (6.11 and 5.4731). Thus, particular laws, such as Hamilton's principle, would seem to be significant propositions which can be either true or false, for it is only the *possibility* of the law which is *a priori*, not the actual law. Equally, remark 6.34 seems to imply that the particular laws of science are propositions which can be true or false, since the law of continuity in nature is an *a priori* intuition of a possible form of a proposition of science, and propositions of science are significant propositions. It is important to note, however, that Wittgenstein does not say "possible proposition" of science, but rather "possible form" of a proposition of science at both 6.33 and 6.34.

Black writes that "if form is itself a possibility, the phrase ['possible form'] shows redundancy" (Black, p. 346). I do not think this is right. I think Wittgenstein is trying to stress that the law of causality, law of continuity in nature, etc., not only are not themselves propositions, but also only indicate certain groups of possibilities, the members of the group sharing a particular form. On this view, causal laws need not be considered propositions of science, but rather forms of the actual propositions of science. Thus far, however, Wittgenstein has said nothing about the particular status of the laws of science, and any judgment about their status would be premature. The status

of the laws of science is the subject of some debate in the various commentaries on this section and is discussed at greater length in Section VIII.

## VI. *The Net Metaphor*

Wittgenstein has been making clear what belongs to the logical (analytical and *a priori*) and what belongs to the accidental (empirical). I have suggested his remarks go against epistemology and metaphysics. What belongs to the domain of logic says nothing about the world, while propositions which can be true or false and do say something about the world are accidental. Philosophical problems arise from a misunderstanding of the logic of our language, which includes the nature of a proposition. One result of this misunderstanding is that philosophers have thought that there have been propositions which are both *a priori* and informative. Neither the law of induction nor the law of causality, though for different reasons, are informative *a priori* propositions. Minimum laws in mechanics, as well as the law of continuity in nature and the law of least expenditure in nature, and others of this sort, likewise, are not synthetic *a priori* propositions, but instead are either forms of laws of a particular kind, class names or *a priori* intuitions of possible forms of the propositions of science. By getting clear on the status of these "laws", Wittgenstein is clearing up the confusions which give rise to philosophical problems. These problems include the role of epistemology in philosophy and the status of the *a priori* which stem from a misunderstanding of the logic of our language.

Part of getting a clear understanding of the logic of our language involves recognizing that philosophy is not in any way a science, in either its method or its results, as many philosophers, Russell especially, have thought<sup>23</sup>. For Wittgenstein, "[p]hilosophy is not one of the natural sciences" (4.111). And "the result of philosophy is not a number of philosophical propositions," as

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<sup>23</sup> See *Problems of Philosophy*, pp. 86-87 and 90, as well as "On Scientific Method in Philosophy" in *Mysticism and Logic*, Ch. 6, pp. 75-93 (The Herbert Spencer Lecture, Oxford, 1914). The latter promotes the scientific method in philosophy, though a separation is made between philosophy and the empirical sciences.

the result of science is a number of scientific propositions. Rather its task is "to make propositions clear" (4.112). Thus unlike science, philosophy does not provide a body of propositions or a theory; it is an activity of making propositions clear (4.112). But logic *is* related to science insofar as it "limits the disputable sphere of natural science". To clarify the relationship between logic and natural science, which is an aid in limiting the sphere of science, Wittgenstein introduces what has come to be known as "the net metaphor", using mechanics as an example.

He writes,

Newtonian mechanics, for example, brings the description of the universe to a unified form. Let us imagine a white surface with irregular black spots. We now say: Whatever kind of picture these make I can always get as near as I like to its description, if I cover the surface with a sufficiently fine square network and now say of every square that it is white or black. In this way I shall have brought the description of the surface to a unified form. This form is arbitrary, because I could have applied with equal success a net with a triangular or hexagonal mesh. It can happen that the description would have been simpler with the aid of a triangular, and coarser, than with the finer square mesh, or vice versa, and so on. To the different networks correspond different systems of describing the world. Mechanics determine a form of description by saying: All propositions in the description of the world must be obtained in a given way from a number of given propositions--the mechanical axioms. It thus provides the bricks for building the edifice of science, and says: Whatever building thou wouldst erect, thou shalt construct it in some manner with these bricks and these bricks alone.

(As with the system of numbers one must be able to write down any arbitrary number, so with the system of mechanics one must be able to write down any arbitrary physical proposition.) (6.341)

Here we have a white surface with irregular black spots (which is analogous to the world), different descriptions of that surface, and the possible unified forms given to those descriptions (particular nets, e.g. a triangular net or a square net). Looking at Figure A (see the last page of this section), we see that there are two black irregular spots on a white surface. A network (or grid) can be placed on top of this surface and it is possible to say of every square, with co-ordinates  $(x,y)$ , whether it is white or black, e.g., "(12, 22) is white"; "(12, 23) is black", and so on. In this way, by covering the surface

with a net and indicating whether each square is black or white, the "description of the surface is brought to a unified form" (6.341). It is unified because the description conforms to one particular system in the sense that all of the propositions which describe are formulated from the framework of the particular mesh. If we look at Figure A, the propositions which can be either true or false and describe, e.g. "(2,4) is black", obtain their form from the particular net used. It is in this way that the system says "Whatever building thou wouldst erect, thou shalt construct it in some manner with these bricks and these bricks alone" (6.341). In Figure A, the bricks used to build propositions will include the variables  $x$  and  $y$ , the possible specific values of which are stipulated by the axioms. In the case of Figure A, the axioms provide, for example, the parameters of the values of  $x$  and  $y$  and their combinatorial possibilities. Thus the proposition "(2,4) is black" can be formulated. It is in this way that "with the system of mechanics" one is able to "write down any arbitrary physical proposition". Every proposition that is possible, given the system, can be formulated; the system is complete.

The form of the description is *arbitrary* because, Wittgenstein tells us, a net with a triangular or hexagonal mesh could be applied with *equal success*<sup>24</sup>. That different meshes can be applied with

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<sup>24</sup> That a method of representation, or network, is arbitrary is of particular importance to later discussions of Wittgenstein's transitional period. R. Alva Noe, in "Wittgenstein, Phenomenology and What it Makes Sense to Say" points out that the Hintikkas misread Wittgenstein insofar as they argue that it was only after he recognized that a phenomenological language was impossible that he realized that grammar was arbitrary. Prior to this, the Hintikkas claim, Wittgenstein felt that the grammar of phenomenological language could not be arbitrary since it is determined by the essential nature of experience. Thus on the Hintikkas view, "Wittgenstein's recognition of the impossibility of a phenomenological language just was tantamount to the recognition that there *could be* no language the grammar of which was determined by the nature of reality" (Alva Noe, p. 24). In response, Alva Noe writes,

It was not the impossibility of a phenomenological language that convinced Wittgenstein of the arbitrariness of grammar. The converse is the truth. From the beginning of 1929 Wittgenstein had explored the significance of the idea that the phenomenological investigation and the grammatical investigation were in fact one. But this led him finally to realize that the appropriate philosophical task ought not to be that of developing a notation that is structurally isomorphic with reality, but ought rather to be that of understanding what it makes sense to say about experience. But since what it makes sense to say about experience is independent of what experience is like--since any description of what experience is like begs the issue of what it makes sense to say about experience--there is no need for phenomenology, nor for a new phenomenological notation (Alva Noe, p. 25).

equal success is extremely important to Wittgenstein's analogy. For although he states that a description might be simpler with, for example, "the aid of a triangular, and coarser, than with the finer square mesh, or vice versa" this does not mean that the application of one network over another is in itself more or less successful in terms of its capacity to describe the world. Each network corresponds to a particular "system of describing the world" (6.341). Thus, in telling us that different possible meshes or methods of description can be applied with equal success, Wittgenstein is telling us that all possible methods of representation are necessarily equally successful because they are each *capable* of describing the world. It is in this sense that they are arbitrary, for it is not something about the world which determines a *possible* form of representation. A possible form of representation is a logical possibility and has nothing to do with the way the world is. The success in its application which each mesh shares is that it can be used to describe the world. At the same time, however, the description of the world may be simpler with one mesh than with another, but this does not in any way affect the fact that different meshes are *capable* of describing the world and can be applied with equal success (in the sense that they are all equally possible meshes that can be used to describe the world).

Not recognizing that Wittgenstein's point is that the networks are all possible ways of bringing the description of the world to a unified form has led to some confusion in the literature. Thus when discussing Wittgenstein's net metaphor, B.F. McGuinness, in "Philosophy of Science in the *Tractatus*", writes that "[a] coarser mesh is preferable, though Wittgenstein does not say this"

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Indeed, although Alva Noe does not mention it, Wittgenstein's notion of the arbitrariness of grammar is present as early as the *Tractatus* insofar as methods of representation, or networks, are claimed by Wittgenstein to be arbitrary. In this same vein, Wittgenstein's point in 6.341 is to highlight that what is possible, i.e., a method of representation, has nothing to do with, and is not determined by reality. This is in keeping with Wittgenstein's aim to separate what is logical (and says nothing about the world and, we might add, which is not determined by the world) and what is accidental and does say something about the world, as he states it in 6.3.

(McGuinness, p. 12). McGuinness implies that such a claim follows from Wittgenstein's net metaphor, though it goes unmentioned by Wittgenstein. Though not clear in his article, McGuinness seems to think that a coarser mesh would be better since it would be less difficult to discover laws which fit the facts once the network is applied to the world (McGuinness, p. 12).

I think, however, that Wittgenstein had a clear reason for not stating what kind of meshes are "preferable" and that is that any such question is not at all in the spirit of what he is trying to show. His point is that *all* possible networks provide forms for descriptions of the world. "It can happen that the description would have been simpler" with one net or another, but we cannot know in advance which nets are better than others. This is because, first, there is no *a priori* reason for preferring one net over another (just as there is no *a priori* reason for believing in a law of conservation as we saw in Section V), and second, because it is scientists who prefer one network over another, depending on their aims. Given these considerations, stating which mesh is preferable makes no sense since it is either to assume that there are *a priori* reasons for preferring one mesh over another (which there cannot be since logic tells us nothing about the world), or it is to engage in science, which would involve actually applying a particular mesh and deciding whether or not it is preferable given a particular purpose (and neither Wittgenstein nor McGuinness are engaged in this project).

Wittgenstein's next remark emphasizes, and clarifies, his project of showing us what is logical and what is accidental -- in this case, the relationship between logic and mechanics (science).

He writes,

And now we see the relative position of logic and mechanics. (We could construct the network out of figures of different kinds, as out of triangles and hexagons together.) That a picture like that instanced above can be described by a network of a given form asserts *nothing* about the picture. (For this holds of every

picture of this kind.) But *this* does characterize the picture, the fact, namely, that it can be *completely* described by a definite net of a *definite* fineness.

So too the fact that it can be described by Newtonian mechanics asserts nothing about the world; but *this* asserts something, namely, that it can be described in that particular way in which as a matter of fact it is described. The fact, too, that it can be described more simply by one system of mechanics than by another says something about the world (6.342)<sup>25</sup>.

What exactly is the "relative position of logic and mechanics"? It is clear that the propositions of logic are not assertions. They are tautologous and it is nonsense to assert them. The fact that a picture can be described by a network (e.g., mechanics), Wittgenstein tells us, "asserts *nothing* about the picture". Thus, the relative position of logic and a network is that *neither* assert. If we look at Figure A, this point becomes clear: The mesh which is placed on top of the black and white surface is empty and says nothing about the surface (all it is is a network of squares and two axes). The fact that such a network can be used to describe the surface asserts nothing, it is simply a possible method of representation. Indeed, this occurs with every picture. Nothing is asserted by the fact that a picture *can* be described by a particular network.

What does assert something is the actual way in which the surface is described. Thus while the fact that the world can be described by Newtonian mechanics asserts nothing about the world, the particular way in which Newtonian mechanics provides a unified description of the world does assert something. Each proposition stated in a form provided by Newtonian mechanics has a *sense*, and as such, each is an assertion that can be true or false depending upon the way the world is. If we look at Figure B (see the last page of this section), this point becomes clear: The picture formed by the two black spots on the white surface in Figure A is characterized (one might even say

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<sup>25</sup> The net metaphor appears almost verbatim as early as 1914 as well as this remark, 6.342. In his notebooks, Wittgenstein adds after 6.342: "I have felt this for a *long* time" (*Notebooks*, 2nd ed., pp. 35e-36e).

'pictured') by a complete description using the particular network (which is a definite net of a definite fineness). Each proposition which is given a form by the network, e.g. "(2,4) is white", is either true or false, that is, it has sense and says something about the world. What is more, saying of each square whether it is black or white provides us with a *complete* description (in this case literally a picture) of the surface to which it is applied since every proposition which is possible within the particular system can be formed. This is clear from Figure B.

Analogously, just as the relative position of logic and mechanics is that neither assert anything about the world, they also have a relative position in the way they function in terms of what can be asserted. The net can be seen as an example of a co-ordinate system which is similar to that discussed at 3.4 and 3.41 regarding propositions and logical space:

The proposition determines a place in logical space...(3.4).

The propositional sign and the logical co-ordinates: that is the logical place (3.41).

The analogy we are given here is that of a logical co-ordinate system in which propositions determine their place through their logical co-ordinates and propositional signs. The metaphor of logical space and a co-ordinate system is analogous to Wittgenstein's discussion of mechanics, where mechanics is also likened to a co-ordinate system. Thus, while both logic and the networks are empty and assert nothing, propositions, which do assert, lie within a logical co-ordinate system or within a system of mechanics (network). Given these considerations, the relative position of logic and mechanics becomes clearer in that we see that neither asserts anything, yet all assertions or propositions conform to a particular network. And, as is evidenced by Wittgenstein's earlier claim, "Every picture is *also* a logical picture. (On the other hand, for example, not every picture is spatial)" (2.182). Every proposition, which necessarily is a picture, is logical, but not every proposition conforms to, for example, a system of geometry. Thus we see that *all* propositions

which assert have a logical form, and all possible methods of representation (different networks) are logical possibilities which do not themselves assert anything. The different networks give a form to the particular propositions within that system which do say something about the world, however. It is in these ways that logic and mechanics occupy a "relative position".

Figure A

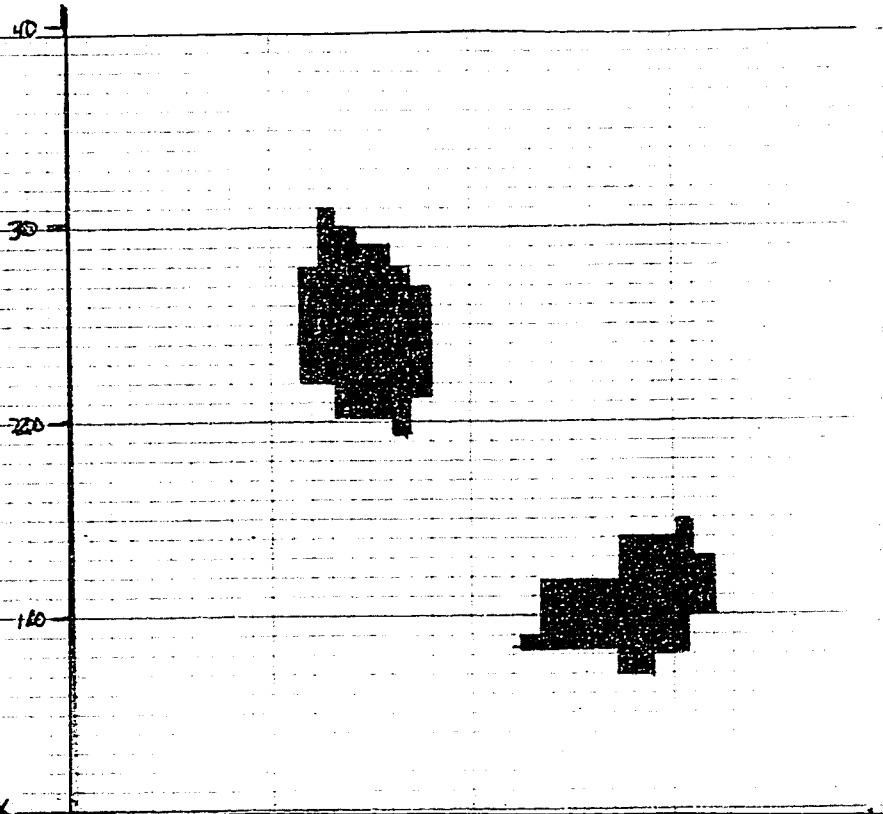
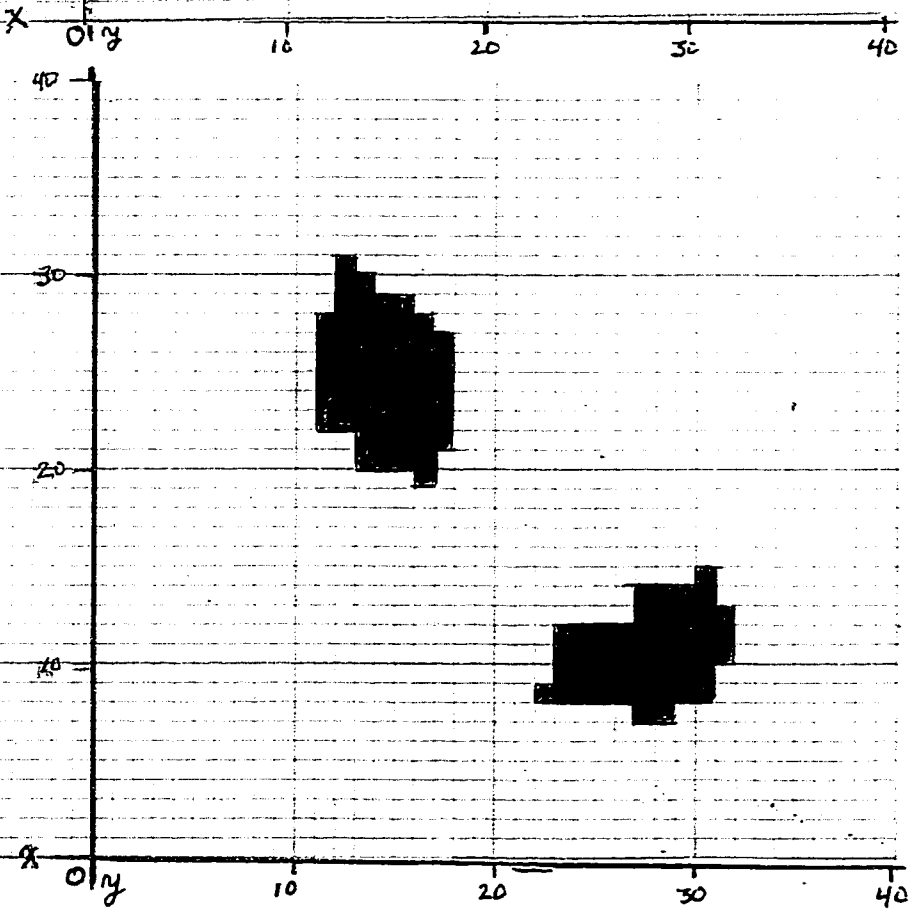


Figure B



## VII. Wittgenstein's Alleged Conventionalism

It is sometimes argued that because Wittgenstein stresses the arbitrariness of scientific systems he is a conventionalist. Black, for example, writes,

What remains important in Wittgenstein's account is his stress upon the relative arbitrariness of scientific theory. This is perhaps too reminiscent of the conventionalism of Poincaré, Duhem, and others, to count as original, but it is a point of fundamental importance (Black, p. 351).

H.O. Mounce summarizes the conventionalist view of Wittgenstein clearly:

To say the world is such that it can be described by Newtonian mechanics is just as uninformative as to say that the paper can be described by means of a square mesh. For there are any number of other systems by which the world can be described, as the paper can be described not simply by a square mesh but also by a triangular or hexagonal one.

To some this may appear as a kind of conventionalism, as if Wittgenstein were saying that the facts of the world are determined by the theories we hold about them (Mounce, p. 78).

Mounce responds to the conventionalist interpretation of Wittgenstein by pointing out, first, that the different ways of representing the world are not equally useful, and second, that even if our choice of mesh is conventional, the description would not be so since, in the example of the white surface with black spots on it, whether or not it is correct to say of a square that it is black or white does not depend on the mesh, but the actual surface (Mounce, pp. 78-79). It is the *facts* which determine what it is correct to say, not the arbitrary choice of a particular mesh.

Mounce's response to the interpretation of Wittgenstein as a conventionalist is convincing. Although the choice of mesh is arbitrary, the truth or falsity of the particular propositions (which have the form provided by the mesh) is in no way determined by the mesh, but rather by the way the world is. What is more, if the mesh determined the truth or falsity of the particular propositions, Wittgenstein would in some way be taking the *a priori* to be informative since the net, which is *a*

*priori*, would determine how the world is as opposed to providing a framework within which the facts can be stated. Thus it would be possible to have *a priori* knowledge about the world. But as we saw in Sections IV and V, it is just this view that Wittgenstein takes issue with.

Black's claim that Wittgenstein is a conventionalist stems not only from his misinterpreting the net metaphor, but also from his misunderstanding Wittgenstein's project of showing what is empty and what has sense. According to Black, it is not just the arbitrariness of the net that is problematic but also the fact that it only provides syntactical rules, not semantical ones. Black writes,

The syntactical rules of the theoretical sub-language are the literal correlate of what Wittgenstein called the 'form' of the network; the semantical rules answer to the procedure for placing the net over the figure and obtaining a determinate verdict (Black, p. 350).

But,

...it is hard to see how, within the framework of the *Tractatus*, [Wittgenstein] could have accepted the idea...that semantical as well as syntactical rules are needed (Black, p. 351).

So the failure of Wittgenstein's net metaphor (and the *Tractatus*), as Black sees it, rests on a distinction between 'syntactical' and 'semantical' rules. This, however, is a distinction Wittgenstein does not make, only Black. The problem arises because Black takes the network to provide syntactical rules which tell us only the combinatorial possibilities of empty symbols and leaves their meanings unaccounted for. I think this is a misinterpretation of Wittgenstein not only because he makes no distinction between syntactical and semantical rules, but because, for him, the combinatorial possibilities of symbols depends on their having meaning (which is possibly why he made no distinction between the two kinds of rules).

The tautology "It is raining or not raining" is a tautology because of the meanings of its parts,

not because it is an illicit combination of empty symbols. "It is raining" has meaning, as does "It is not raining" and it is by virtue of their meanings that when combined together with an "or" a tautology is formed. And it is only through the meanings of symbols that combinatorial possibilities come to light. For Wittgenstein, logical syntax is not the syntax of signs devoid of meaning, but the syntax of symbols which have meaning<sup>26</sup>. What is more, Wittgenstein does not make distinguish between logical syntax and application as Black seems to when he claims that Wittgenstein does not account for the procedure of placing a net over a figure. Wittgenstein speaks, for example, of "logical syntactic application" at 3.327. Thus Black's claim that Wittgenstein's account fails to supply semantical rules seems unjust, first, because Wittgenstein includes meanings in his logical syntax, and second, because he does not separate logical syntax from application.

Without denying that symbols have meanings and that we have procedures for using networks, Wittgenstein makes the point that every network is a possible mesh which can be used to describe the world, or to use his analogy, every possible network is capable of describing the figures. To say that 'semantical' rules are required in order to apply the network is to miss the logical point that each network is a possible method of representation. Wittgenstein is focusing on methods of representation in general, not just on the method of representation in the sciences. Wittgenstein is not attempting to provide an account of how we apply a particular network. He is trying to show us what cannot have sense and therefore does not assert anything (a network) and what has sense and does assert (propositions formulated within a particular network).

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<sup>26</sup> It should be noted that at 3.33 Wittgenstein states that "[i]n logical syntax the meaning of a sign ought never to play a rôle". This remark, however, is against Russell who, in his Theory of Types, must mention the meaning of his signs. Wittgenstein's point is not that his new symbolism is only about combinatorial possibilities of empty signs (as Black might contend), but rather that Russell's theory is inadequate because he has to state the meanings of the signs and his symbolism does not preclude misunderstanding and error.

That Black views Wittgenstein as focusing on one method of representation and as giving us an account of how networks are applied is further evidenced by his conclusion that,

Stripped of its picturesque trappings, Wittgenstein's view amounts to an emphasis upon the need in a theoretical science for a suitable *language* (the 'net'), complete with syntactical and semantical rules for its use (Black, p. 349).

We just saw that Black faults Wittgenstein's system for being incapable of accounting for semantical rules. Part of why he may have come to such a conclusion may stem from his general reading, as we saw in Section V, that Wittgenstein's emphasis is on "the *variability* of scientific systems of representation" (Black, p. 346). Given his focus on science only and not methods of representation in general, Black sees Wittgenstein's net metaphor as emphasizing "the need in a theoretical science for a suitable *language* (the net)" (Black, p. 349).

I think this is incorrect. Wittgenstein has made no comments regarding what the sciences "need", nor what would be "suitable". The closest he comes to such a claim is at 6.343, where he writes,

Mechanics is an attempt to construct according to a single plan all *true* propositions which we need for the description of the world (6.343).

This claim, however, is a remark only about the unity of mechanics (it is a single plan) and its scope and aim, specifically, that all the propositions needed for the description of the world will be constructed in accordance with mechanics and they will hopefully all be true. But this remark, it seems, is about what Wittgenstein feels is already the case; that is, that scientists are already doing this, not that they ought to do this.

The main emphasis of these sections is on the arbitrariness of meshes and the relative position of logic and mechanics on the one hand and what has sense (asserts) and what does not on

the other. This is very different from Black's conclusion that Wittgenstein is telling us what science "needs" and what is "suitable". Wittgenstein is assuming that scientific systems *already* are suitable and have what they need (though scientists are still engaged in the task of attempting to construct according to a single plan all true propositions needed for the description of the world). Like ordinary language, the language of science is already logically in order and is not deficient (5.5563). Any possible language in science will necessarily be suitable insofar as it is a possible method of representation (see the discussion of 6.342 above).

There are at least two reasons why Wittgenstein makes no mention of semantical rules and does not distinguish between syntactical and semantical rules. First, his notion of rules for combining symbols assumes, and even requires, that they have meaning. And second, his project is not to tell us how science functions or ought to function, but rather what is capable of asserting and what is not.

Confusing claims about how science ought to be or how particular systems are applied to the world in science with the very different task of clarifying the relationship between logic, methods of representation and what can be asserted, further leads Black to interpret Wittgenstein as making substantial claims about the nature of the world. In summarizing Wittgenstein's net metaphor, Black writes,

It is therefore misleading to call Newtonian mechanics either true or false, for the same reasons that render it misleading to assign a truth-value *simpliciter* to a given geometry. Yet, as Wittgenstein sees clearly, the choice of one system of mechanics rather than another, of one theoretical language rather than another, is not wholly arbitrary. Although no scientific language can fit the world perfectly, the extent of the adjustments needed to obtain empirical consequences of a predetermined accuracy is a measure of the theory's adequacy (Black, pp. 347-8).

Black's interpretation seems correct insofar as Wittgenstein tells us that although different networks

can be applied with equal success and thus are arbitrary, the description of the world may be simpler with different networks; "that is to say we might have described the surface more accurately with a triangular, and coarser, than with the finer square mesh, or vice versa, and so on" (6.341). In this sense, a scientist's choice of network is not arbitrary, though the possibility of describing the world with different networks is.

But allowing that a scientist may choose different networks for particular purposes does not imply or commit Wittgenstein to saying that "no scientific language can fit the world perfectly", as Black says. Such a claim presupposes a notion of things which we can never quite know (or describe). On Wittgenstein's view there is no position from which to make a statement such as "no scientific language can fit the world perfectly". Since a network provides all possible propositions which can be true or false within a given system, it is in this sense complete. It would be impossible to state what is left out, or not described, since it is the system which provides the possibility of describing in the first place. Thus while one network may describe the world more accurately than another, this is not the same as saying that "no scientific language can fit the world perfectly", which is either a metaphysical or epistemological claim and would be rejected by Wittgenstein.

Black's focus on science and what scientists do, and his failure to see that Wittgenstein's aim is to make clear what has sense and what does not, further leads him to misinterpret Wittgenstein's remark that a surface can be described completely by a given network. In response to Wittgenstein's claim that a picture "can be *completely* described by a definite net of a definite fineness" (6.341), he writes that this is so

only in the case of the analogy of the net. In scientific description, there is no such thing as a 'complete' description and every measurement leaves room for further accuracy of specification (Black, p. 353).

Having a scientific background, Wittgenstein would have been well aware of how scientists actually proceed. It is unlikely, then, that he would have overlooked the fact that scientists' measurements, for example, are never absolutely accurate. Instead, Wittgenstein's claim ought to be read as a comment on how the net functions and how it is possible to characterize a picture of, for example, irregular black spots on a white surface. The surface can be characterized completely by a net because the net provides a form for *every* possible proposition which has a sense. Wittgenstein's point regarding completeness is a point about how the net functions in terms of propositions which have sense, and not how, in science, the truth or falsity of a proposition may be determined (i.e. what degree of error is acceptable, etc.). This holds for every method of representation in science, not just an actual net, since with any system or net "one must be able to write down any arbitrary physical proposition" and thus every system will provide all possible propositions which describe the picture and will be complete.

In summary, Wittgenstein's net metaphor is an analogy he uses to make clear the relative position of logic and mechanics for the purposes of further clarifying what has sense and can assert and what does not have sense and cannot assert, which Wittgenstein states in the Preface is the aim of *Tractatus*. Recognizing this aim avoids misinterpretations which lead to erroneously charging Wittgenstein with conventionalism or interpreting him as making *a priori* claims as to what kind of mesh is preferable (McGuinness) or that we can never quite describe the world perfectly (Black). Not only are these views which Wittgenstein does not espouse, they are views that he would reject as making no sense.

### VIII. Laws

Thus far, I have been trying to clarify Wittgenstein's view of the relative position of logic and mechanics. Every proposition which pictures and has sense is logical, though logic itself says nothing. Similarly, every proposition in mechanics is asserted within mechanics, though mechanics itself says nothing about the world. This accords well with Wittgenstein's task, as we saw in sections II through V, of showing that *a priori* propositions cannot be informative. If the net is *a priori* and yet could be true or false (say something about the world), then it would be possible to have *a priori* knowledge of what the world is like. Yet, as Wittgenstein points out, the net says nothing, and hence cannot be informative.

Still, it is not wholly clear what constitutes the net and what is asserted within the framework of a net. In particular, it is unclear just what status the physical laws have, i.e., particular laws such as Hamilton's law which states that light chooses the path of least action as opposed to the so-called law of induction, law of causality, law of continuity in nature, law of least expenditure in nature, etc. Although most commentators on the 6.3s agree that an entire system, such as Newtonian mechanics, asserts nothing about the world, there is little agreement regarding the status of scientific laws. This lack of agreement, I will argue, stems from interpretations which do not properly differentiate between what is *about* the network, what *belongs* to the network and particular propositions the form of which is provided *by the network*. That said, however, it must be admitted that the text itself is not entirely clear. As we saw in the discussion of remarks 6.3211, 6.33 and 6.34 in Section V, some of Wittgenstein's remarks intimate that the propositions of science, which are supposed to be capable of being either true or false, are *laws*. Hamilton's Principle is one. Thus while it is clear that for Wittgenstein the net is not capable of being true or false, it is not clear what belongs to the net. If

laws are capable of being true or false, they cannot be part of the net. But then how are they to be understood?

The problem of the status of physical laws and what belongs to the net crops up more clearly at 6.3431. After telling us that mechanics asserts nothing about the world, but that the particular way in which the world is described by mechanics does assert something, Wittgenstein says that,

Through their whole logical apparatus the physical laws still speak of the objects of the world (6.3431)<sup>27</sup>.

According to the numbering system, this remark is a comment on 6.343, and is not as important as earlier remarks, yet it is hard to square with them. If physical laws (*physikalischen Gesetze*) are not propositions which can be true or false since they are part of the net, then how is it that they still "speak" of the world? It is only propositions with sense that "say" anything (tautologies, contradictions and mathematical pseudo-propositions "say" nothing). Yet if physical laws are understood as propositions which can be true or false and are therefore not part of the net, then what exactly does the net consist in, if not laws? I will return to this problem after a discussion of the next two remarks, which provide a clearer understanding of Wittgenstein's distinctions between what is about the net, the net itself, and particular propositions cast in terms of the net.

Wittgenstein's next remark does not seem to resolve the problem, though it reinforces the view that the net (in this case mechanics), says nothing about the world. He writes,

We must not forget that the description of the world by mechanics is always quite general. There is, for example, never any mention of *particular* material points in it,

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<sup>27</sup> In *Letters to C.K. Ogden*, Wittgenstein discusses 6.3431 twice. In his first edit, Wittgenstein asks that the word "through" be used instead of "throughout". He describes the sense of his use of the word "through" as when someone says, "I speak through a tube" or "I hear his voice through a wall"(p. 35). In a later edit, Wittgenstein continues this analogy of a wall when he discusses the addition of the word "still". To express his use of the word "still", Wittgenstein writes, "Although the wall is very thick *still* you hear his voice through it"(p. 50). In this sense, the logical apparatus can be likened to a wall, and while walls *say* nothing, voices, that *do* say something, can be heard through them. There is no mention of the words "however indirectly" which appear in the Pears and McGuinness translation.

but always only of *some points or other* (6.3432).

It is clear from 6.341 and 6.342 that mechanics says nothing about the world. This remark can be seen as differentiating what says nothing from what says something about the world. The net which says nothing, is "quite general" and does not mention particular material points, but only "some points or other". It could be argued that Wittgenstein is contradicting his earlier remarks because, strictly speaking, mechanics does not "describe" the world, i.e., it does not say anything about the world. I think, however, this use of the word "describe" need not be read as though Wittgenstein were now saying that mechanics "says" something (i.e. is made up of significant propositions). Rather, I think he is using this word simply to make the point that, Newtonian mechanics, for example, speaks of the way "all bodies" have uniform motion unless otherwise acted upon, as opposed to particular bodies.

Interpreting 6.3432 as a remark which emphasizes that the net says nothing about the world accords well with Wittgenstein's next remark at 6.35 (though 6.35, given the numbering system, is not a comment on 6.3432). He writes,

Although the spots in our picture are geometrical figures, geometry can obviously say nothing about their actual form and position<sup>28</sup>. But the network is purely *geometrical*, and all its properties can be given a priori.

Laws [*Gesetze*], like the law of causation [*Satz vom Grunde*], etc., treat of the network and not of what the network describes.

This remark supports Wittgenstein's earlier claim that a net says nothing about the world. Geometry, or a net (which according to the previous remark is "quite general"), can say nothing about the actual form and position of, for example, geometrical figures (or "particular material points").

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<sup>28</sup> This use of the word "form" is to be understood as the shape of the figure and should not be confused with Wittgenstein's earlier technical use of the word "form" in connection with logic.

The difference, and the relationship, between geometry and what can say something can be understood in the following way: A proposition of geometry such as "The figure *fgh* is a triangle" does *say* something about the shape of the figure and is an accidental (or empirical) statement. Geometry, however, which specifies the forms of particular propositions, *says* nothing<sup>29</sup>. This even though the assertion "The figure *fgh* is a triangle" is expressed *in terms of* the concepts of geometry. All the properties of the network can be given *a priori*, but since geometry or a net says nothing about the world, both the net and the properties of the net are not, and cannot be, comprised of or expressed as informative propositions, still less synthetic *a priori* propositions. Laws, such as that of causation, and, it might be added, those of continuity in nature, of least action, etc. (as we saw in 6.34) are about the net, and not what the net describes. Thus they cannot be informative. They are about the net, not about the world.

I have been suggesting that Wittgenstein works with a threefold distinction within which to view the relationship between the logical and the accidental in science. In these terms, the law of causation, the law continuity in nature and the law of least expenditure, etc., treat of the network. They can be understood as forms of laws, which, as we saw in Section IV, stem from Wittgenstein's view of picturing and his understanding of the proposition as a truth-function. A proper understanding of the logic of our language, then, will make clear that propositions which have sense cannot be about forms though each proposition which has sense has a form. It is senseless to assert that a form exists or to view any claims involving forms as informative statements. Second, there

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<sup>29</sup> Wittgenstein seems to have still held this distinction, between the net and what is asserted within the net, in the 1930's. In a lecture on generality and geometry, in *Wittgenstein's Lectures, Cambridge 1930-1932*, he is recorded as stating  
It appears at first sight as if there were concepts of points, lines, etc. and things that are points, lines, etc.  
This is not so. A point is not a concept at all. What then is generality in geometry? It has two senses—(i) the generality of geometrical rules, (ii) the generality of the application of geometry. The application depends on what the world is like (p. 18).

is the net itself. It too says nothing about the world, though the description of the world by means of the net will. The net is *a priori* and cannot be true or false; it makes no sense to assert the "propositions" it is comprised of. Once again we see that what is *a priori* cannot be informative or about the world. Third, there are particular propositions made within the framework of the net. These are descriptions of the world and can be true or false and as such they are synthetic, but not *a priori*. In summary, that which treats of the net and the net itself are to be seen as *a priori* and belonging to "logical research" while particular propositions which receive their form from the net and do say something about the world are to be seen as part of the "accidental" (6.3).

## **IX. M. Black on Laws**

I will now return to the question of the status of the physical laws. Although commentators have provided different answers to this question, the issue is not just one of the status of the laws, but how, on the whole, one is to understand the threefold distinction between what is about the net, what constitutes the net, and what is a significant proposition, the form of which is provided by a network. In the following discussion, I compare and contrast five authors not just on their views of the status of the physical laws, but more importantly on their understanding of the three types of "propositions". I start with Black's remarks in his commentary.

For Black, the problem with Wittgenstein's discussion of scientific propositions is that it does not accord with the picture theory. He writes,

...the 'picture theory' is too simple to serve as a model for all uses of language. Wittgenstein had to choose between liberalizing his conception of the essence of language, because it failed to fit scientific propositions, or denying that science was really composed of propositions. Whatever choice is made, there results a liberalization of the *Tractatus* conception of language and its functions. (If we insist that scientific formulas are not propositions, we shall have to admit new senses of the *a priori*.) Once it has been conceded that a scientific theory escapes the jurisdiction of the principle of extensionality, so that its formulas have empirical significance without being 'logical pictures', Wittgenstein's philosophy of language is ripe for reform (Black, p. 352).

In Section VIII, I said that Wittgenstein's remark at 6.3431, which states that the physical laws still speak of the world, causes problems for a consistent interpretation of the 6.3s. The problem is that if the physical laws "speak" of the world, then it seems they are true or false and cannot be part of the network. This issue seems to be present in Black's diagnosis of the problem of the 6.3s. For Black, that "the formulas of a scientific theory have empirical significance" at least in part stems

from 6.3431<sup>30</sup>. Yet at the same time, the formulas of scientific theory are not extensional propositions (that is, logical sums or products; propositions whose truth-values are determined by the truth-values of elementary propositions). To claim that scientific formulas are not propositions would lead to a new sense of *a priori*, which to Black, is unacceptable. The problem Black sees, then, is that scientific formulas, if they are viewed as propositions which have empirical significance, do not fit with Wittgenstein's view of the proposition as a picture since they "escape the jurisdiction of principle of extensionality" (Black, p. 352).

Before looking at Black's proposed solution to this problem, it will be helpful to outline how he understands the three distinctions between the "propositions" of science, that is, what is about the net, what constitutes the net, and what is a significant proposition, the form of which is provided by a network. This will help us in determining what he means by "scientific formulas", since Wittgenstein does not use this term. Black sees laws such as those of causation and least action, which I have been arguing are about the net, as regulative principles. He writes,

Wittgenstein's view about the relation of such regulative principles to the world seems to come to this: they express options for the syntax of possible languages of

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<sup>30</sup> It is worth noting that in another section, Black offers an interpretation of 6.3431 which is different (see p. 348). In this section, he takes Wittgenstein to be claiming that the net, all of it, says something about the world. But this seems to run contrary to Wittgenstein's remark that the net says nothing about the world and that it is *a priori*. Black interprets 6.3431 as follows:

The connexion of the theory with the world shows itself in the degree of elaboration (the fineness of the meshes, in Wittgenstein's analogy) needed for a given degree of accuracy to be attained within a prescribed mode of representation. As the shape of the suit tells something about the contours of its wearer, though the fit is imperfect, so the choice of the most suitable co-ordinate system tells something about the character of the actual world. In this way the theoretical sciences, however indirectly, 'still speak about the objects of the world' (6.3431) (Black, p. 348).

Black's interpretation implies, first, that a finer mesh is preferable and fits the world more accurately, and second, that nets do not quite 'fit' the world. It is true that at 6.342 Wittgenstein states that the fact that the world "can be described more simply by one system of mechanics than by another says something about the world" (6.342). But, as we saw in connection with McGuinness' claim in Section VI that a coarser net is preferable, this in no way implies *a priori* that one net is preferable than another or that one net 'fits' the world more accurately. What is more, Black's interpretation emphasizes the words "however indirectly", which he later (rightly) claims ought to be deleted since they do not occur in the original text (Black, p. 361). By emphasizing these words, it seems we are to understand that the physical laws speak of the world indirectly because they can never quite fit the world. This is another example of Black imposing on Wittgenstein the view that we can never quite describe the world exactly, which, as we saw in Section VI, invokes a notion of something that exists, but can never be known or described.

science (6.34, heavily glossed) (Black, p. 344).

Although Wittgenstein does not use the word "syntax" in this section, Black's comment accords with the view I have been espousing that such laws are possibilities (forms) of the particular laws of science. But then Black adds that the "law of causation" is

...a grammatical prescription for bringing the 'description of the world' into a 'unified form' (6.341*a*) (Black, p. 344).

This seems confused. The first sentence of 6.341, which Black cites as support for his view of the law of causation as a prescription, runs as follows:

Newtonian mechanics, for example, brings the description of the universe to a unified form (6.341).

On Black's view, the law of causation is part of Newtonian mechanics, or the net, since it brings the description of the world into a unified form as Wittgenstein says mechanics does. But Wittgenstein tells us at 6.35 that the law of causation *treats* of the network, and thus it is not *part* of the network except insofar as certain laws have a causal form. It is Newtonian mechanics which brings the description of the world into a unified form, not the law of causation, since the law of causation treats of, for example, Newtonian mechanics (a net). Thus while it may be right that laws such as that of causation express options for the syntax of possible languages of science, it seems wrong that such laws are part of the net and bring the description of the world to a unified form. Black seems to be confusing the possibility of a particular net with an actual net which does bring the description of the world to a unified form<sup>31</sup>. For this reason, he conflates what Wittgenstein says is about the

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<sup>31</sup> Black also seems to confuse Wittgenstein's specific remarks regarding the law of causation. In his discussion of 6.32, he interprets the remark as stating that the law of causation "expresses the possibility of there being empirical generalizations of a certain kind [i.e. of a causal form]" (Black, p. 345). But, as I noted at the end of Section IV, Wittgenstein has not yet told us what the status of particular causal laws are, or even if they are empirical generalizations. More problematic, however, is Black's remark which directly follows:

This reading [of 6.32 as an expression of the possibility of there being empirical generalizations of a certain kind] agrees with the remarks that immediately follow (6.321-6.34), but seems to conflict with 6.36*a*, where a

net with what he says is the net itself.

In terms of the network itself, Black does not see it as made up of laws. He writes,

...the 'propositions' comprising a given scientific theory, such as Newtonian mechanics, might be considered as having the function of syntactical rules for determining what shall count as a law and as an observation within that branch of science (Black, p. 351).

Thus for Black the 'propositions' of Newtonian mechanics function as syntactical rules in the same way that he earlier suggested the law of causation does. That aside, however, it is clear that the net, according to Black, provides the syntactical rules for "determining what shall count as a law and as an observation". Thus both the laws and observations, according to Black, are part of what is stated within the framework of the net, and therefore are propositions with sense, while the net itself consists of syntactical rules.

But Wittgenstein does not use the words "syntactical rules" nor does he say anything in this section about "observations". I think Black's use of these terms stems from interpreting the 6.3s as a section on the philosophy of science and ignoring Wittgenstein's much larger aim of trying to make clear what has sense and what cannot have sense. As I mentioned in Section V, it is this predisposition on Black's part that leads him to interpret 6.3211 as focusing on the variability of

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categorical sense is imputed to the 'law of causation' (Black, p. 345).  
Black seems to think that the law of causation has sense since, as Wittgenstein writes at 6.36a,

If there were a law of causality, it might run: "There are natural laws" (6.36).

Immediately following this, however, Wittgenstein writes,

But that can clearly not be said: it shows itself (6.36).

Thus, it is clear that for Wittgenstein, sense is not imputed to the law of causality, for "There are natural laws" cannot be said. Black seems to be aware of this, for when discussing remark 6.321, he writes,

...by the time we reach 6.36a [the same sentence he refers to in his discussion of 6.32] the 'law of causality' has been emptied of any determinate meaning (Black, p. 345).

If the law of causality has no determinate meaning, then it cannot have sense, for what can be true or false has sense and only what has sense can have meaning. Either Black is making a distinction between meaning and sense which Wittgenstein does not, or his conflicting remarks are an oversight on his part. I think it clear, however, that Wittgenstein's remarks in the 6.3s about the law of causation do not conflict for the reason Black gives, namely, that Wittgenstein both denies and claims a categorical sense for the law of causality.

scientific languages rather than as a criticism of epistemology and the view of the *a priori* as informative (or synthetic). And as we saw in Section VI, this also leads him to charge Wittgenstein with conventionalism. Wittgenstein makes no mention of "observations" because he is concerned with the question of which propositions can have sense and which cannot (and hence are not really propositions), not with the question of how scientists proceed or how they use observation<sup>32</sup>.

It seems clear that Black sees the network as providing the syntactical rules for the determination of what counts as a law and what counts as an observation. In addition, it seems he takes the laws and the observations to be propositions with sense, though he does not state this explicitly. In keeping with Wittgenstein's claim that the net says nothing about the world, he understands the laws comprising Newtonian mechanics as neither true nor false. Thus if Black does see the laws which are determined by the net as true or false, there must be some distinction, on his view, between the laws comprising a system and the laws stated within that system.

The status of the laws (stated within a particular framework) as true or false comes into question in Black's discussion of F.P. Ramsey. Black writes,

Ramsey's treatment of scientific laws as 'variable hypotheticals' (*Foundations*, p. 237-55) is also clearly indebted to Wittgenstein. His remark that 'a variable hypothetical...is not strictly speaking a proposition at all, but a formula from which we derive propositions' (*op. cit.* p. 251) is quite in the spirit of the *Tractatus*. ...Ramsey extend[s] Wittgenstein's ideas about scientific theory to the derivation of scientific laws (general propositions relatively close to the crude observational data): I think Wittgenstein might have accepted this (Black, p. 351).

The trouble is that on Ramsey's view the laws which Black says are determined by the net and ought to be capable of being either true or false are incapable of being true or false since they are 'variable

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<sup>32</sup> For a good discussion of the lack of mention of "observation" in the *Tractatus*, see Anscombe, pp. 25-28. Anscombe argues against interpretations such as Popper's, which equate elementary propositions with observation statements.

hypotheticals'. It is *these* 'variable hypotheticals' which will make up the net (or more particularly, Newtonian mechanics). Thus the scientific laws, on Ramsey's view, are not "general propositions relatively close to the crude observational data" which can be true or false; they are not propositions at all according to Ramsey. What is more, Ramsey never says 'variable hypotheticals' are "relatively close" to "crude observational data".

The view of laws as general propositions which are "relatively close to the crude observational data" (Black, p. 351) not only does not accord with Ramsey's discussion of 'variable hypotheticals', but contradicts the *Tractatus* in at least two ways. First, if the laws are to be true or false as Black contends, then there is no question of them being "relatively close" to "crude observational data", for on Wittgenstein's view, what can be true or false must picture a possible state of affairs. A proposition does not picture "relatively close[ly]" -- it either pictures or it does not. And again, there is no mention on Wittgenstein's part of observation or "crude" observation. Second, if the laws are to be conceived of as not being capable of being true or false (or even as Ramsey states, as 'variable hypotheticals'), it cannot be because they only fit the "crude observational data" in a "relatively close" way. If a law is incapable of being true or false, it simply does not picture. Wittgenstein nowhere says that a law cannot be true or false because it only approximates to our observational data -- indeed, if we follow Black's earlier contention, it would be the syntactical rules comprising the net which would tell us what count as observations to begin with. Thus if we interpret Black as saying the net is a set of syntactical rules for determining what will *count* as a law (which will be capable of being true or false), his view does not accord with Ramsey's notion of 'variable hypotheticals', which *are* laws that are incapable of being true or false and would be part of the net.

Recall that the problem Black posed for Wittgenstein is that scientific formulas, if they are viewed as propositions which have empirical significance, do not fit with Wittgenstein's view of proposition as a picture since they "escape the jurisdiction of principle of extensionality" (Black, p. 352). This problem seems to be resolved if we understand the net as comprising syntactical rules which determine what is to count as a law or as an observation (with the proviso that Wittgenstein does not use the word "syntactical" in this section and says nothing about observations). On this view, the laws (or scientific formulas) which comprise the net have empirical significance only insofar as they are syntactical rules. They need not adhere to the principle of extensionality since they are not truth-functions and they do not picture. And the laws which are not part of the net, but which are stated according to the syntactical rules which comprise the net, are empirical generalizations.

The relationship between the laws of Newtonian mechanics and empirical generalizations (which Black also calls laws) is stated by him as follows:

Taken all together, Newton's laws imply that deviations from the natural motions (i.e. as measured by the rate of changes of the momenta of the bodies in question) must be expressible as functions of the masses of the bodies and their mutual distances, the precise form of the function being left open for empirical determination. (Newton's law of gravitation is a famous example of such a determination...) (Black, p. 357).

Thus Newton's laws, which would be part of the net, determine, for example, that deviations from natural motion can be expressed by functions, the variables of which will be 'mass' and 'mutual distance'<sup>33</sup>. The precise form of the function, however, would be determined empirically, i.e., to

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<sup>33</sup> Roughly speaking. Newton's three laws can be summarized as follows:

- (1) Every body continues in a state of rest, or uniform motion in a straight line, unless it is compelled to change that state by a force impressed upon it.
- (2) The change of motion is proportional to the motive force impressed; and is made in the direction of the straight line in which that force is impressed.
- (3) Action is equal and opposite to reaction (Black, p. 354).

discover what constants there may be in the function will be an empirical determination<sup>34</sup>. On this view, there are two notions of laws -- those which comprise Newton's system and those which have empirical significance (e.g., the law of gravitation).

With a distinction between kinds of laws, Black summarizes what he interprets as the *Tractarian* view of scientific theories:

...the principles of mechanics are neither empirical generalizations, nor *a priori* truths. Taken together, they constitute an abstract scheme of explanation, within whose framework specific laws of a *predetermined form* can be formulated and tested. If I am correct, Wittgenstein's central idea in his discussion of the philosophy of science has thus been vindicated (Black, p. 360).

The laws comprising mechanics, then, are rules, but not empirical generalizations. The rules will give the form of possible empirical generalizations, such as Newton's Law of Gravitation. Since Black states that the laws formulated within the "abstract scheme of explanation" can be "tested", it seems to follow that they can be true or false and accord with Wittgenstein's picture theory. This view certainly would seem to vindicate Wittgenstein's discussion of science as Black interprets it. However, on Black's own view, Wittgenstein's discussion is only partially vindicated. (We shall see in the following discussion of B.F. McGuinness, who does interpret empirical generalizations as truth-functions which picture, that Black does not agree.) Instead, Black seems to think that all of the laws, be they syntactical rules and part of the net or possible laws determined by the net, are incapable of being truth-functions of elementary propositions. They cannot be because the former

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<sup>34</sup> For spherical bodies, the function which determines the gravitational force is as follows, where  $M_1$  and  $M_2$  equal the masses of the two bodies;  $R$  is the distance between the two bodies; and  $G$  is the constant, empirically determined, and is equal to  $6.670 \times 10^{-8}$ :

$$F = \frac{GM_1M_2}{R^2}$$

*The Encyclopedia of Physics*, p. 391.

are syntactical rules and the latter are not finite conjunctions (which would conform to the principle of extensionality). It is perhaps for this reason that Black sees his own views as according with Ramsey's since whether or not a law is part of the net or an empirical generalization, it nevertheless is not a proposition which 'pictures' if it is a 'variable hypothetical'.

X. *B.F. McGuinness and H.O. Mounce on Laws*

Unlike Black, McGuinness sees Wittgenstein's discussion of science as consistent with the picture theory (McGuinness, p. 12). He writes,

To turn now to the actual laws: the general answer about their status will be clear from what has been said: they are propositions with sense, pictorial propositions, being truth-functions (admittedly generalized ones) of elementary propositions. That is how physics manages to talk about objects in the world (6.3431) (McGuinness, pp. 13-14).

This conception of laws, unlike Black's, requires no deviation from Wittgenstein's truth-functional view of the propositions. Since the laws are propositions with sense, they say something, and there is no problem in accommodating Wittgenstein's remark at 6.3431, which states that the laws of physics, with all their logical apparatus, still speak of the objects of the world.

Why would Black find this view unacceptable? Part of the reason may be that he thinks that in science, induction is used. The net provides a "framework [within which] specific laws of a *predetermined form* can be formulated and tested" (Black, p. 360). But these laws are not finite conjunctions which would be candidates for truth-functions. Instead they are hypotheses which generate a potentially infinite number of propositions. It is in this way, perhaps, that Black is thinking that they are "tested". That Black would not accept McGuinness's view of the laws as truth-functions is clear in the discussion which took place after McGuinness presented his paper. Black asks McGuinness: "La théorie des fonctions de vérité qui marche en logique, comment l'appliquer en Mécanique?" (McGuinness, p. 18) Black does not mention anything about hypotheses, but his view that truth-functions cannot be applied to mechanics supports the view that, for him, the laws cannot be finite conjunctions (which conform to the principle of extensionality), but must be infinite conjunctions (which escape the principle of extensionality and hence cannot be truth-functions).

McGuinness's interpretation of the physical laws as truth-functions stems from his general view of what constitutes the net and is *a priori*, and what is formulated within the net and is a significant proposition. According to McGuinness, Wittgenstein's aim in the 6.3s is to show

...that various types of propositions found in science can be accounted for without supposing that there are propositions which are *neither* propositions with sense (i.e. pictorial propositions) *nor* propositions without sense (i.e. tautologies or contradictions) (McGuinness, p. 11).

Scientific propositions, then, are consistent with Wittgenstein's view of propositions since they *either* have sense (pictorial) *or* have no sense (tautologies or contradictions).

For McGuinness there is no threefold distinction in the 6.3s between what treats of the net, the net, and the propositions which conform to the net. He writes,

...the answer about scientific propositions is twofold, according as we direct our attention to general Principles of Nature (such as the Principle of Induction itself, the Law of Causality, or the Principle of Least Effort) or to particular applications of these which enable us to predict actual events or the results of experiments (McGuinness, p. 11).

McGuinness separates what he calls the Principles of Nature from predictions or results which will be applications of these Principles, which will be the laws that are significant propositions (McGuinness, p. 11 and 13). The Principles of Nature are *a priori*, first, because laws can be formed connecting physical phenomena which conform to the Principles (McGuinness, p. 11). These laws are propositions with sense which manifest the possibility of particular propositions which will also be propositions with sense. Secondly, the Principles of Nature are *a priori* because we can adopt them and make them part of the net (McGuinness, p. 12). This second way of being *a priori*, McGuinness claims, corresponds to Wittgenstein's point that we can make up our network of squares, triangles or hexagons, etc. (McGuinness, p. 11).

On McGuinness's view, the Principles of Nature, both as possibilities of particular laws that

are true or false and as part of the net, are *a priori*. This is consistent with Wittgenstein's claims that, first, the law of causality is the form of a law (6.32) and, second, that the net says nothing about the world (6.342). The only trouble is that Wittgenstein never claims that we can "adopt" these Principles and make them part of the network. Rather, he tells us that such laws *treat* of the network and not of what the network describes (6.35). "Treating" of the network is very different from actually being part of the network, and it remains unclear how the Principles can both treat of the network and at the same time be part of it. How, for example, can the law of causality be part of the network if Wittgenstein writes,

If there were a law of causality [*Kausalitätsgesetz*], it might run: "There are natural laws" [*Naturgesetze*].

But that can clearly not be said: it shows itself (6.36)?

Given this remark, it is unclear how the law of causality (*Kausalitätsgesetz*) can be part of the network, or in any way correspond to "making up our network of squares, triangles, or hexagons". On McGuinness's view, Newton's laws either are not part of the net, which is clearly contrary to what Wittgenstein actually says, or if they are, then they are comparable to the law of causation (*Satz vom Grunde*), the law of continuity in nature and the law of least action, etc., which does not seem to be what Wittgenstein is saying either. Nor does it seem to be what Newton's laws in fact are (Newtonian mechanics consists of causal laws, but not the law of causality, for example). On the one hand, if the Principles are not part of the net, and only treat of the net, the problem for McGuinness is that the only other candidates which can be part of the net are the actual laws, which he says are propositions with sense. On the other hand, if the actual laws make up the net and are propositions with sense, then the net clearly must be understood as saying something about the world, which contradicts Wittgenstein's remarks at 6.341, 6.342 and 6.35.

In summary, McGuinness's account of what he calls the Principles, the network and propositions with sense is one way in which 6.3431 can be accommodated insofar as the laws will be propositions with sense and thus "speak" about the world. This interpretation also renders Wittgenstein's discussion consistent with his distinction between propositions which say nothing (the Principles) and propositions which do say something (laws and particular propositions) in a way which does not violate the truth-functional view of the proposition. Also Black's concern that new senses of the *a priori* would have to be admitted since scientific formulas have empirical significance and yet are not pictorial is addressed. Still McGuinness's account fails to distinguish between what is about the net, the net itself, and the particular propositions which assert, the forms of which are provided by the net. It conflates what is about the net with the actual net.

For H.O. Mounce, like McGuinness, the laws of science are significant propositions which can be true or false (Mounce, p. 75). But some laws, such as the law of causality, are not statements at all and say nothing about the world (Mounce, p. 75). Thus, in keeping with Wittgenstein's "absolute distinction between the generality of logic and what he terms accidental generality" certain laws fall into the category of logic, e.g., the law of causality, while other laws, the laws of science, fall into the category of the contingent (Mounce, p. 73). Mounce writes,

Thus 'Everything has a cause' tells us nothing about the world. What does tell us something, what *is* a matter of the facts, is that we assign causes in the way we do, i.e., in *this* way as opposed to some other. At the time of the Tractatus, Wittgenstein expressed this by saying that 'Everything has a cause' is the form of a law; it does not tell us what actually holds. In his later work, he would have expressed this by saying that the proposition expresses something that belongs to our method of representation rather than to the facts that are represented. Given the occurrence of one event, we are to link it to the occurrence of another. But it does not tell us what links actually hold (Mounce, p. 77).

On this view, laws such as the law of causality belong to our method of representation. It is these

laws which are *a priori* and say nothing about the world, whereas it is the particular laws, those, for example, of the causal form, which are significant propositions which can be true or false.

It is unclear, on Mounce's view, whether or not the law of causality, for example, is part of the net, or as Wittgenstein says, is about the net (6.35). Thus it is not obvious that Mounce would agree with McGuinness that the law of causality and other such laws can be adopted and are therefore part of the net. But Mounce does claim that other kinds of laws (e.g. laws of the causal form, though not the law of causality) are contingent. He writes,

What we have so far, then, in Wittgenstein's account is a vigorous assertion of the view that physical science is concerned with the accidental or, better, contingent [excluding the law of causality, etc.]. Laws of nature provide a summary of what we have found to be so (Mounce, p. 75).

Thus, like McGuinness, the laws which have a causal form will be true or false. This view equally accords with McGuinness's claim that such laws are truth-functions, though Mounce does not discuss this aspect. But if these laws are contingent, it seems they cannot be part of the net since Wittgenstein clearly states that the net says nothing about the world. In the end, then, Mounce's view is the same as McGuinness's insofar as all that is left to be part of the network are laws such as the law of causation. But, as we saw when discussing McGuinness's view, these laws *treat* of the network and are not *part* of it. Thus if we exclude the law of causation and other such laws from the net, it seems as if the net contains no laws whatsoever.

Mounce's inattention to the net and what it might consist of is further exemplified in his discussion of why the network says nothing about the world. He writes,

To say the world is such that it can be described by Newtonian mechanics is just as uninformative as to say that the paper can be described by means of a square mesh. For there are any number of other systems by which the world can be described, as the paper can be described not simply by a square mesh but also by a triangular or a hexagonal one (Mounce, p. 78).

Thus, the fact that it is possible to describe the world by Newtonian mechanics says nothing, for this is just, as I mentioned in Section VI, a logical possibility. But this is only one reason why the net says nothing about the world. According to Wittgenstein, the network is wholly *a priori*. This is so not only because other networks are possible, but because the net *itself* says nothing. On this view, it is not just the possibility of there being other networks that describe the world that tells us nothing about the world, but also the fact that no net itself says anything about the world. "The network" Wittgenstein says at 6.35, "is *purely* geometrical, and all its properties can be given *a priori*". If the network is wholly *a priori* it cannot comprise laws that are summaries of experience, since they would be significant propositions. Yet if it does not contain these laws, as we saw with McGuinness, it seems that the net contains only laws such as the law of causality. If these laws are about the net, and not part of the net, however, what does the net consist in? And we again seem driven to regard Newton's laws as equivalent to the law of causality, etc.

With both Mounce and McGuinness we see that there is a separation between the laws such as that of causality, etc., which are *a priori* and say nothing about the world, and particular laws which would have, for example, a causal form and are contingent. This is in keeping with Wittgenstein's distinction between logical generality and accidental generality. And Mounce, like McGuinness, does not have a problem accounting for how laws speak of the world (6.3431), since these laws will be contingent and capable of being true or false. Equally, both views accord with the picture theory since the laws which are "summaries of experience" can be viewed as truth-functions. Despite these advantages, however, both commentators fail to distinguish between what is about the net, the net, and propositions, the forms of which are given by the net. They conflate what Wittgenstein says is about the net with what is the net. Claiming that the law of causality is part of

the net contradicts Wittgenstein's remark that it is about the net and also does not seem to accord with Newtonian mechanics, the laws of which are not, for example, 'the law of causality'.

## **XI. G.H.R. Parkinson and G.L. Proctor on Laws**

For Parkinson, unlike Mounce, the laws of physics are not summaries of what has been observed, such as the statement "All ravens are black" (Parkinson, p. 67). He writes,

The laws of physics are stated in mathematical form, and mathematics is a method of logic (6.2, 6.234). The propositions of logic, as we know, are tautologies, but Wittgenstein holds that the laws of physics are not. As he puts it (6.3431), 'The laws of physics, with all their logical apparatus, still speak, however indirectly, about the world' (Parkinson, p. 68).

Again we see the influence of 6.3431, which for Parkinson, tells us that the laws of physics are not tautologies because they speak of the world, albeit "indirectly". But neither are they empirical generalizations. Instead, they provide "a way of talking about the world. As such, they are neither true nor false" (Parkinson, p. 68). On this view, Parkinson can allow that there are empirical generalizations which are true or false, but these do not constitute the laws of physics as they do for both McGuinness and Mounce (they are part of physics, but not part of the net).

Although Parkinson does not state a threefold distinction explicitly, what he says allows for the possibility that what is about the net, the net itself, and the assertions within the net are all different. First,

Wittgenstein says that laws such as the principle of sufficient reason are about the net and not about what the net describes (6.35) (Parkinson, p. 69).

The law of causality does not itself say anything, but "that there are laws of nature" is shown by the fact that we find them (Parkinson, p. 69). The law of causality and other such laws, then, are about the net. Second, the actual net is comprised of laws which are stated in mathematical form and can be neither true nor false (Parkinson, pp. 68-69). While these laws are not tautologies, they are also not contingent. Instead they provide a way of talking about the world. Third, propositions which are contingent will conform to these natural laws insofar as the laws provide the propositions with

a particular form. That is, we use the network "to state certain propositions and deny others" (Parkinson, p. 69).

Since the network says something only insofar as it provides a way of describing the world, the laws of nature which comprise it do not *explain*, they only describe (Parkinson, p. 67). He writes,

...natural laws do not explain, they describe, and we have been seeing the way in which they describe [by providing a way of talking about the world] (Parkinson, p. 69).

Given this view, it is unlikely that Parkinson would agree with Black that the principles of mechanics "constitute an abstract scheme of explanation," though he would likely agree with Black that it is from within this framework that "specific laws of *predetermined form* can be formulated and tested" (Black, p. 360). Like McGuinness's view, these would be empirical generalizations which are truth-functions and accord with the picture theory. Similarly, although Parkinson and Mounce would disagree that the laws of nature summarize experience (for Parkinson they are not summaries of experience), they both agree that the laws do not explain. However, whereas for Mounce the laws of nature do not explain because they are summaries, for Parkinson, they do not explain because they only describe (in the sense that they provide a way of talking about the world).

So I think that Parkinson's discussion best reflects the threefold distinction which seems evident in the 6.3s between what is about the net, the net itself, and what is a proposition which receives its form from the net. On his view, there is no question as to what constitutes the net as there is with McGuinness and Mounce. As well, I think it is very likely that Wittgenstein was thinking of the laws of nature, which comprise, for example, Newtonian mechanics, as having a mathematical form. What is more, on Parkinson's view, there would be little concern about the *a priori* nature of the net (as we saw with Black) since mathematics, for Wittgenstein is *a priori*. It

is true that the laws comprising the net would not be truth-functions (they are neither tautologies nor significant propositions; they are mathematical formulas) and in this sense they are not pictures. Thus the problem Black raises of how the laws can say something about the world, or have empirical significance, and yet not accord with the picture theory is resolved: We can think of the laws as mathematical propositions which are empty, but which provide a way of talking about the world in terms of truth-functions that are significant propositions which picture. Parkinson does, however, seem to use a strange definition of the word "describe" when he states that the laws of physics describe since they provide a way of talking about the world. It is not clear that he has provided a satisfactory account of 6.3431, which says that the physical laws still speak of the objects of the world, by claiming that these laws describe by providing a way of talking about the world. Given his interpretation of the laws, it seems more consistent to state that if the laws provide a way of *describing* the world, then they do not themselves describe anything.

Proctor also contends that natural laws describe, but for different reasons. The problem that Proctor raises for the *Tractatus* is that if scientific laws are taken to be empirical generalizations,

...then all they could describe would be facts that have already occurred, and hence they would have no predictive power by means of which significant propositions about the future can be formulated and subsequently verified (Proctor, p. 203).

But if scientific laws are conceived of as rules, so that they would have predictive power, then they would be prescriptive, rather than descriptive. If they were prescriptive, though, "they would have nothing to do with the world that science is describing" (Proctor, p. 203). This issue is similar to Black's concern, which is that the propositions of science are exempt from the principle of extensionality and do not accord with Wittgenstein's truth-functional view of the propositions. As I suggested in Section VIII, it is a concern with accounting for the predictive nature of science that

may have led Black to such a view. Similarly, we see that on Proctor's view, if one conceives of scientific laws as prescriptions, or as Parkinson contends, as providing a way of talking about the world, they do not describe. But as I suggested at the end of my discussion of Parkinson, the view that the laws describe by providing a way of talking about the world is problematic since providing a way of talking about the world is not to describe anything. To use Proctor's language, if the laws are conceived as "prescriptions" for propositions which do describe the world, then these prescriptions cannot themselves also be descriptions.

Proctor's solution to the problem of how scientific propositions can be both prescriptive and descriptive is to argue that both systems (networks) and laws are generalized propositions. He writes,

...if laws organize these propositions [of science] according to their logical forms, then systems are ways of organizing laws into a single unified whole. If this is so, then both laws and systems are, in some sense, generalized propositions (Proctor, pp. 203-204).

These generalized propositions ought to be understood as *descriptions* of particular classes of propositions (Proctor, p. 204). Following remark 6.3432, Proctor notes that a system is a generalized description of the world (Proctor, p. 203). And since laws, according to 6.35, *treat* of the network, they are also generalized propositions and describe the network (Proctor, p. 203).

Although Proctor acknowledges that laws treat of the network, he takes laws such as that of causality to be the same as empirical generalizations since both are general propositions. For him, the laws organizing "the true propositions of science which are of various forms" are the same as laws which also *treat* of the network (Proctor, p. 203). But, if these laws treat of the network by organizing the true propositions of science, then the network would seem to be comprised of significant propositions (propositions of science being true or false). On the other hand, if the laws

are seen as comprising the network, it is unclear how they can also treat of the network. On this view, either the law of causality and other such laws have the problematic role of being about the network and yet also being part of the network, or, equally problematic, the network is to be understood as consisting of empirical generalizations, which are significant propositions.

Proctor is not without an answer as to how a law can be both about the network and also part of it, however. We saw a moment ago that he takes both a system and laws to be generalized propositions. They are not, however, empirical generalizations and this seems to be because there really are no empirically general propositions. He gives two reasons for this. First, all non-elementary propositions can be constructed *a priori* by a successive application of logical operations on the elementary propositions. And second, there are no complex facts which are described by empirically general propositions (Proctor, p. 204). He writes,

...there is no pictorial relation between an empirically general proposition *per se* and a fact; the pictorial relation holds only for elementary propositions and atomic facts. Indirectly, an empirically general proposition may describe the facts of the world in so far as the constituent elementary propositions that can be inferred from it picture possible atomic facts. But no generalization is, in itself, a possible description of what is the case (Proctor, p. 204).

But every generalization, according to Proctor, does describe insofar as it gives a "'description' of the elementary propositions which are all its 'values'" (Proctor, p. 204). Thus "All x's are mortal" can have as a value the general proposition "All men are mortal" which in turn can have the value "This fat man is mortal" (Proctor, p. 204). Thus the general propositions describe certain classes of propositions, be they empirically general propositions or the law of causality. Since they are "descriptive of propositions as propositions, general propositions treat of the symbolism and not of what is symbolized" (Proctor, p. 204).

Though he does not say so, much of Proctor's account seems to stem directly from

Wittgenstein's remarks in the 3s<sup>35</sup>. When discussing propositional variables, Wittgenstein writes,

If we change a constituent part of a proposition into a variable, there is a class of propositions which are all the values of the resulting variable proposition (3.315).

If *all* the signs of a proposition are turned into variables, the proposition "corresponds to a logical form, to a logical prototype" (3.315). And further,

The determination of the values [of the propositional variable] *is* the variable (3.316).

The determination of the values of the propositional variable is done *by indicating the propositions* whose common mark the variable is.

The determination is a description of these propositions...

And *only* this is essential to the determination, *that it is only a description of the symbols and asserts nothing about what is symbolized* (3.317).

By indicating the propositions which share a common mark (the variable), one can give a description of such propositions. It is in this way that a law could be both part of the net and about the net. As a general proposition it is descriptive of propositions as propositions and treats of the symbolism, not of what is symbolized.

But Proctor also adds that empirical generalizations do not really picture. He can allow them to be part of the network since they are really no different from the law of causality. Thus the law of causality and an empirical generalization are both essentially *forms* of propositions and can be part of the network. He writes,

Natural laws, then, being general propositions, will have the character of being logical models from which all propositions of certain logical forms can be derived or formulated and as such are possible forms in which the propositions of science can be stated [6.34]. As empirical generalizations based on past experience, they are logical sums or logical products of those propositions of certain forms that have been found to be true descriptions of actual states of affairs. But the scope of an empirical generalization is wider than the propositions describing past and present facts, since a general proposition is a description of *all* its values (Proctor, p. 205).

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<sup>35</sup> For an interpretation of these remarks not unlike Proctor's (though it is not applied to the 6.3s), see Anscombe, p. 144.

Thus general propositions, be they the law of causality or empirical generalizations, are, for Proctor, all natural laws. In this way, Proctor sees himself as accounting for natural laws as both descriptive (since they describe propositions as propositions) and prescriptive (rules for formulating propositions). He writes,

Natural laws, then, have the character of being kinds of shorthand expressions of propositions of a certain logical form found to be true descriptions of facts of a given structure, as well as the character of being logical models in accordance with which we can formulate propositions descriptive of future facts of the same logical structure (Proctor, p. 205).

Natural laws group together propositions of a certain form which have been found to be true and are logical prototypes for forming future significant propositions. They are propositional functions which can be understood in two ways, either as logical products or sums or as logical prototypes (Proctor, p. 206).

Proctor's account is problematic for four reasons. First, his claim that empirical generalizations have no pictorial relation with the facts and are not in themselves possible descriptions of what is the case seems incorrect. It is true that general propositions are truth-functions of elementary propositions which picture atomic facts, but Wittgenstein nowhere claims that general propositions are not themselves pictures. J. Griffin, when discussing general propositions, writes,

I do not mean that only elementary propositions are pictures, because this obviously is not what Wittgenstein says; all significant propositions are pictures (Griffin, p. 110).

To support this view, Griffin cites 2.11, which has the plural "Sachverhalten" and 4.011 which speaks of ordinary propositions, not just elementary ones, as picturing<sup>36</sup>. On Proctor's view, if one

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<sup>36</sup> Griffin also cites 2.203 and 3.

takes a picture of the Parliament buildings, the picture is not really a picture of the buildings, but only of each brick. It might be added that Wittgenstein tells us that there is nothing more or less in the analysis of a proposition. At 2.0201 he writes,

Every statement about complexes can be analysed into a statement about their constituent parts, and into those propositions which completely describe the complexes.

Thus not only do empirical generalizations picture, but their constituent parts *completely describe* the *complexes*, implying that nothing is lost or gained in the analysis of a proposition. On this view, empirical generalizations picture, just as elementary propositions do.

The second problem with Proctor's account is that he really does not answer his own question as to how a law of nature can "describe". Wittgenstein does say, in his discussion of variable propositions, that the determination of the values of the propositional variable, which is done by indicating the propositions whose common mark the variable is, is "a description of these propositions". But he does not mean that the proposition *pictures* the propositions the way a proposition pictures a possible state of affairs. The proposition describes a possible state of affairs, a possible configuration of the objects of the world (a fact). Moreover, it is true that propositions are also facts, so that in this sense a proposition can picture, or describe, another proposition. However, Wittgenstein's use of the word "describe" in the 3s is not of this sort. The logical form or logical prototype (*Urbild*) is, as Black points out, "not a picture of the form in the sense of W.'s 'picture theory', but rather embodies the form; it shows what every proposition that is an instance of the *Urbild* has in common with its sense" (Black, p. 126). Proctor's answer as to how a proposition can be both a prescription and a description thus rests on his changing the notion of description from a picture which describes a possible state of affairs, to a prototype which embodies a form and does

not say anything about the world. The issue for most commentators, such as Black, however, is how the laws have *empirical* significance, that is, how they picture possible states of affairs in the world, and this issue is at the heart of problem between prescribing versus describing. Understood in this way, Proctor's response really does not address the problem he sets out to resolve since he changes the definition of "description" so that it no longer pertains to empirical significance.

The third problem is that it is unclear how the law of causality can be a general proposition at all. We saw in Section IV that as the form of a law it cannot be expressed in a proposition which has sense. Any proposition which attempted to *express* the law of causality is senseless. Indeed, at 6.36, Wittgenstein tells us that,

If there were a law of causality, it might run: "There are natural laws".  
But that can clearly not be said: it shows itself.

In this remark, Wittgenstein tells us that the law of causality cannot say anything. More importantly, however, he brings into doubt that there *is* a law of causality. If the law of causality is senseless, then it may be a logical prototype, as Proctor contends. But if the law of causality cannot be expressed *at all* then Proctor's contention that it is a general proposition which describes a class of propositions is seriously jeopardized.

The fourth problem with Proctor's account is that he allows empirical generalizations to be part of the net. But if empirical generalizations are supposed to be capable of being either true or false, then the network is no longer *a priori* since it is comprised of significant propositions. Proctor attempts to account for this by claiming that empirical generalizations do not really picture. But as I noted earlier, this conflicts with what Wittgenstein says. A second way of attempting to account for this is Proctor's claim that empirical generalizations can at one time be conceived of as a logical product or sum, while at another time as a rule. But on this view, it would be possible to state that

"Up until such and such a time, Newtonian mechanics was true (or false)". I do not think this is Wittgenstein's view in the 6.3s. Indeed, his aim seems to be that Newtonian mechanics is neither true nor false at any time and that it is wholly *a priori*. Thus the network can in no way be comprised of significant propositions, despite Proctor's account of them.

## *XII. Summary of the Discussion of Laws*

The various discussions of the status of natural laws by the preceding commentators shows that many varied interpretations of Wittgenstein's claims can be formulated. I have been arguing that any acceptable interpretation must take into consideration the following three points:

- (a) there are no informative *a priori* statements;
- (b) there is a threefold distinction between what is about the net, the net itself, and significant propositions, the forms of which are provided by the net; and,
- (c) the physical laws, with all their logical apparatus, still speak of the objects of the world (6.3431).

With Black we saw that no threefold distinction is made and instead he focuses on rendering consistent the claims that "scientific formulas" are both *a priori* and yet empirically significant. His solution is to argue that the laws of nature (those comprising Newtonian mechanics, for example) are syntactical rules, and thus are not *a priori* truths which are about the world. The problem is that the empirical generalizations formulated according to those rules, according to Black, do not comply with Wittgenstein's view of the proposition as a truth-function. But Black fails to take proper account of Wittgenstein's view that significant propositions picture and are informative.

McGuinness also does not adequately take into consideration the threefold distinction, yet sees no problem in accounting for how empirically significant propositions in science accord with the picture theory. For McGuinness, empirical generalizations are truth-functions which picture. Mounce, like Black and McGuinness, makes no clear distinction between what is about the net, the net itself, and propositions, the forms of which are given by the net. While Mounce's view is similar to McGuinness's in that laws are significant propositions which are summaries of experience and can

be true or false, his view incorrectly treats only laws such as the law of causality as *a priori*. This view leads to the net consisting of laws such as that of causality or else significant propositions, neither of which accords with Wittgenstein's discussion of them.

Parkinson's account best reflects the threefold distinction. His attempt to render 6.3431 consistent with Wittgenstein's remarks about the net is unsatisfactory, however. On his view, the physical laws "describe" the world because they provide "a way of talking about it". Yet this confuses providing a method of description of the world with an actual description of the world. Finally, Proctor's account is problematic not only because it does not adequately account for the threefold distinction, but because it denies that empirical generalizations really picture and includes empirical generalizations as part of the network.

Despite these deficiencies, all of the interpretations I have been discussing offer insights into important aspects of the 6.3s. Keeping in mind the distinction between what is about the net, the net itself, and propositions, the forms of which are provided by the net, it seems right that Wittgenstein is telling us that Newtonian mechanics (a net) is an "abstract scheme of explanation" (Black) and provides "a way of talking about the world" (Parkinson). It also seems right that empirical generalizations, with the proviso that they conform to the framework provided by a net, are truth-functions which can be true or false (McGuinness and Mounce). Equally, truth-functions can operate both as logical sums or products and as rules for formulating propositions of the same form (Proctor), so long as we remember that they cannot be part of the net.

(i) *What is about the net...*

Both what is about the net and the net itself are *a priori*. What is about the net are laws such as the law of causality, the law of continuity in nature and the law of least expenditure in nature

(6.34). These laws "treat of the network and not of what the network describes" (6.35). They can be understood as forms of laws or *a priori* "intuitions of the possible forms of the propositions of science" (6.34). In this way, they are *a priori* and say nothing about the world, which is in keeping with Wittgenstein's view that what is *a priori* is logical and uninformative.

(ii) *The net itself...*

The net itself is also wholly *a priori*, and thus cannot consist of contingent propositions, since these propositions are either true or false and do say something about the world. Newton's laws, such as "All bodies move in a uniform direction unless otherwise acted upon" comprise the net. That the network is made up of natural laws is further supported by 6.36, which, as we saw earlier, states:

If there were a law of causality, it might run: "There are natural laws".  
But that can clearly not be said: it shows itself.

That there are natural laws cannot be said, but is shown. Thus the law of causality cannot itself say anything. Similarly, it cannot be said that there are objects, but that there are objects shows itself (see also Section IV and Section XIV). As well, the law of causality treats of the network and not of what the network describes. Thus if the law of causality treats of the network and it attempts to say "There are natural laws", then the network can be understood as comprised of natural laws.

Although the net itself says nothing about the world, it can be understood as describing it in a wholly general way which says nothing about "particular material points [or bodies]", but only "some points or other [or some bodies or other]" (6.3432). This is not a description which can be true or false, however, since the net is not comprised of laws which picture. Newton's laws are not empirical generalizations which can be true or false; they can be constructed *a priori* and all their properties can be given *a priori* (6.35). These laws are related to significant propositions in the same way as logic is: Every significant proposition will have a logical form and every significant

proposition of mechanics will have a form provided to it by mechanics. "All bodies move in a uniform direction unless otherwise acted upon" provides the form for a significant proposition which speaks of particular bodies, e.g., "*a* moves in a uniform direction unless acted on by *b*", where *a* and *b* are particular bodies.

*(iii) Propositions, the forms of which are provided by the net...*

The laws of the network can be used, moreover, to form propositions which do speak about the world and can be either true or false. I think it is only in this way that 6.3431 can be understood; that is, the laws which make up the net do not picture possible facts (configurations of objects in the world), but provide a framework within which propositions which do picture can be formulated. Newton's law of gravity, for example, can be understood as an empirical generalization, or truth-function, which is formulated within the framework of Newtonian mechanics:

$$F = \frac{GM_1M_2}{R^2}$$

In this function,  $M_1$  and  $M_2$  equal the masses of the two bodies;  $R$  is the distance between the two bodies; and  $G$  is the constant, empirically determined, equal to  $6.670 \times 10^{-8}$ . This function is empirical since the constant could have been different given the way the world is. Thus it is a contingent proposition, but it is formulated within the framework of Newtonian mechanics.

What is more, this Law of Gravitation can be understood both as a rule for forming particular propositions as well as a logical product or sum, as Proctor suggests. First, with the particular values filled in, the proposition

$$F = \frac{(6.670 \times 10^{-8})(2)_1(5)_2}{(80)^2},$$

shares the same form of the function and is a proposition which can be true or false. Second, filling in all the possible values of the function renders it a logical product or sum.

(iv) *Remark 6.3431...*

Remark 6.3431, which states that the physical laws, through their whole logical apparatus, "still speak of the objects of the world," must not be understood as stating that the physical laws are actually true or false, for this would make the net capable of being true or false. Instead, it must be interpreted as saying, as Parkinson suggests, that the laws provide a way of talking about the world. This does not mean that they describe in the sense that they picture, though there is a general sense in which the net describes, as we saw earlier. Thus the net, comprised of laws, arranges the facts and provides a way for them to be described. It is the attempt "to construct according to a single plan all *true* propositions which we need for the description of the world" (6.343). Newtonian mechanics, for example, is the "single plan" which arranges the facts in a particular way, e.g., "All bodies move *this way* unless acted on in *that way*". This "single plan" will provide us with a way to describe the world in that each proposition, which can be true or false, will be formulated according to this plan, e.g., the Law of Gravity. The net does not determine *what* is true or false, since it is the facts which do that. But it does provide a way of speaking about or describing the facts. The hope is that the particular plan will provide us a way in which we can construct all the "*true* propositions" needed to describe the world. Indeed, if propositions framed within mechanics are false, we would devise a new plan. In this way, by providing a framework within which to formulate propositions which can be true or false, and therefore do picture the objects of the world, the physical laws speak of the objects of the world.

Wittgenstein's discussion of science is thus in keeping with his remark in the Preface that he

is drawing a limit to the expression of thoughts. For Wittgenstein, "The totality of true propositions is the total natural science (or the totality of the natural sciences" (4.11). But some 'propositions' in science are not propositions at all since they are not capable of being either true or false. These 'propositions' are the laws of nature which comprise the network as well as 'propositions' which are about the network, such as the law of causality. Wittgenstein is outlining in science what is capable of being true or false, that is, what actually is a proposition of science, versus what is not a proposition at all and hence incapable of being either true or false. He is clarifying what has sense from what does not, and in the process cutting epistemology dead and undercutting the idea that some propositions are synthetic *a priori*. On his view, what is *a priori* is purely logical (the network and that which treats of the network) and what is synthetic cannot be *a priori* (propositions conforming to the forms provided by a particular network). The corollary of this is that philosophy, conceived of as logical clarification, no more contributes anything substantial to scientific investigation than scientific investigation contributes something to philosophy. It is in this way that we are to understand that "Philosophy is not one of the natural sciences" (4.111) and that natural science is not philosophy.

### ***XIII. Methods of Representation***

In keeping with his aim of clarifying the status of *a priori* propositions, Wittgenstein expands on his view of causality and considers an example of what is traditionally thought to be a synthetic *a priori* proposition. He first tells us that,

In the terminology of Hertz we might say: Only *uniform* [*gesetzmässige*] connexions are *thinkable* (6.361).

This remark is a comment on 6.36, which states that the law of causality, which might run "There are natural laws", cannot be said, but shows itself. Recall that Wittgenstein opened the 6.3s by telling us that "Logical research means the investigation of *all regularity* [*Gesetzmässigkeit*]" (6.3). We can think of "all regularity" and "uniform" as doing the same work ("*Gesetzmässigkeit*" and "*Gesetzmässig*" respectively). Wittgenstein is telling us that -- as he puts it at 3.03 -- "We cannot think anything unlogical, for otherwise we should have to think unlogically". As a comment on 6.36, Wittgenstein seems to be saying at 6.361 that what cannot be formulated in terms of *some* natural law is not a thinkable situation; that is, what has sense at all will be a connection of things (or possibly events) in a uniform or law-like way. Thus just as "we could not *say* of an 'unlogical' world how it would look" we cannot say of a lawless world how it might look (3.031).

As a comment on 6.361, Wittgenstein next provides us with an example which highlights his claim that the law of causality is the form of a law and also that only uniform connections are thinkable. He writes,

We cannot compare any process with the "passage of time"--there is no such thing--but only with another process (say, with the movement of the chronometer).

Hence the description of the temporal sequence of events is only possible if we support ourselves on another process.

It is exactly analogous for space. 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 (6.3611).

In this remark Wittgenstein discusses both time and space<sup>37</sup>. Wittgenstein first points out that in order to describe a temporal sequence of events, one must use another process since there is no such thing as the "passage of time". This remark applies to causality insofar as causal events are "temporal sequence[s] of events" (the cause occurring prior to the effect). To describe a causal event is not a matter of every event having a cause (the law of causality), but of our ability to compare it with another process<sup>38</sup>. The same applies to space: Saying that neither of two events can occur because there is *no cause* which can be ascribed to one of the events and not to the other, means that we cannot describe the events without some kind of asymmetry. If there is an asymmetry, then it can

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<sup>37</sup> In a letter to Russell in 1914, Wittgenstein writes.

Now for a question: isn't what the "principle of sufficient reason" (law of causality) says simply that space and time are relative? I now think this is quite obvious, because all the events which, according to this assertion, are not meant to be possible could only occur, if at all, in an absolute time and space. (Admittedly this wouldn't in itself be an adequate reason for my assertion.) But think of the case of a particle that is the only thing existing in the world and that has been at rest for all eternity and that suddenly, at time A, begins to move. Think of this and similar cases and you will see, I believe, that it is NOT an a priori insight that makes such events seem impossible to us *unless it is the case* that space and time are relative. Please write and tell me of your opinion on this point (*Letters to Russell, Keynes and Moore*, p. 48).

Wittgenstein's remark at 6.3611 is quite different insofar as it denies that there is such a thing as "the passage of time". Wittgenstein is not claiming at 6.3611 that time and space are relative, but he does discuss the comparison of two processes. It is also helpful to note that he is thinking of time and space as it relates to the law of causality.

<sup>38</sup> Kant, for example, sees the Law of Causality as a synthetic *a priori* truth. We experience the appearance of an event to which we must necessarily ascribe the Law of Causality, a rule which states that events follow upon one another in a necessary order in time. He writes,

In the synthesis of appearances the manifold of representations is always successive. Now no object is hereby represented, since through this succession, which is common to all apprehensions, nothing is distinguished from anything else. But immediately I perceive or assume that in this succession there is a relation to the preceding state, from which the representation follows in conformity with a rule [the Law of Causality], I represent something as an event, as something that happens; that is to say, I apprehend an object to which I must ascribe a certain determinate position in time—a position which, in view of the preceding state, cannot be otherwise assigned. When, therefore, I perceive that something happens, this representation first of all contains {the consciousness} that there is something preceding, because only by reference to what precedes does the appearance acquire its time-relation, namely, that of existing after a preceding time in which it itself was not (Kant, *Critique*, pp. 224-5).

Against such a view, Wittgenstein not only declares that the Law of Causality is uninformative (i.e., not synthetic), but that there is no such thing as the passage of time. Thus the Law of Causality is not about necessary connections between objects in the world, or temporal sequences of events, but about our method of representation.

be used to describe why one event occurred and the other did not. Consider, for example, two particles, A and B. That it is impossible for A and B to both be in the same place, x, at the same time is to say that they are mutually exclusive. If we say that we can describe neither of these events (A being in place x or B being in place x) because there is no cause for one to occur rather than another, we are saying that there is no asymmetry to be found. If there is an asymmetry, for example, if a third particle, C, moves to make space for one of the particles, A or B, to occupy place x, then we can say that the movement of the third particle, C, is the cause of the occurrence of one event (e.g., A occupying place x) and the non-occurrence of the other (e.g., B not occupying place x). Thus what seems impossible (the inability to describe an event because it has no cause), is really a matter of there being no asymmetry between the two events. Without an asymmetry, we cannot compare (as in the first part of this remark) the two events (or processes) and thus we cannot describe them.

Black notes that

[t]his remark connects neatly with W.'s conception of causality as a form of representation (6.34 and especially 6.362). Our choice of the causal form of representation *requires* us to look for an asymmetrical explanation for the occurrence of one event rather than the other (Black, p. 363).

I think Black's interpretation is right and Wittgenstein is expanding on his view of causality. It is not clear, however, given what Wittgenstein has said at 6.361 ("Only *uniform* connexions are *thinkable*") and will say at 6.362 ("[W]hat is excluded by the law of causality cannot be described"), that we can "choose" a causal form of representation. In addition, it might be added that Wittgenstein is drawing attention to our method of representation to highlight the larger point that there are no informative *a priori* truths. When we say that neither of two events can occur in the situation Wittgenstein outlines, it is because our *method of description* requires some sort of asymmetry. But this has nothing to do with the world. It is a requirement of our method of



uninformative since it is logical, just as I have argued 6.3611 does.

Kant's claim was that the incongruity of two things which are exactly alike in all spatial respects is a synthetic *a priori* truth (Black, p. 363; Fogelin, p. 90). Wittgenstein claims that the inability to cover one counterpart by another also exists in a one-dimensional space. Instead of claiming that they are incongruent, he claims that they are completely congruent. In this way, he seems to redefine the notion of "congruency" by claiming that the fact that the two counterparts cannot be made to cover one another has nothing to do with congruency.

Unlike Black, R.J. Fogelin recognizes that Wittgenstein's remark at 6.3611 is an example which is to be read against there being synthetic *a priori* truths (Fogelin, pp. 88 and 90). However, he deems Wittgenstein's argument "just awful" (Fogelin, p. 90). Fogelin's response to Wittgenstein's argument is that

[i]t is surely obvious that Kant's central point is that a right-hand glove and a left-hand glove cannot be made to *coincide* in a three-dimensional space. For this reason he calls them incongruent. Here it will not help to offer--as Wittgenstein does--an alternative definition of congruency. We want to know what the status of the proposition that these two gloves cannot be made to coincide. It seems to be a *necessary* proposition, but not--even on Wittgenstein's broad use of this notion--a *logically* necessary proposition (Fogelin, p. 90).

It seems right that Wittgenstein does change the definition of congruency. I think, however, that Wittgenstein's point--and this is why he draws our attention to the fact that the problem occurs in a one-dimensional space as well as a three-dimensional one--is that the inability to make the gloves coincide has nothing to do with the gloves, but has to do with the dimensions of space in the case concerned. To put it in another way, it is the *net* we are using which makes it impossible to cover the right-hand with the left. On this view, what we have used to define congruency (the ability to cover one glove with another) is part of the network and has nothing to do with what it describes.

It is, then, contrary to Fogelin, a logically necessary proposition that the gloves cannot be made to cover one another and for this reason it is not only not a synthetic *a priori* proposition, but it also has nothing to do with congruency; the gloves are congruent in the sense that they are spatially exactly alike. The fact that they cannot be made to cover one another has nothing to do with congruency, only our method of representation.

Fogelin further interprets Wittgenstein as suggesting that the inability to cover one glove with the other is a *contingency* since it could be turned around in a four-dimensional space. But he thinks this is not a good argument, for

How does this new claim settle the status of the proposition that the gloves cannot be made to match in three-dimensional space, and what shall we say about this new claim itself that they can be made to match in a four-dimensional space? Instead of eliminating a synthetic *a priori* proposition, Wittgenstein seems to have turned up a new one (Fogelin, p. 91).

Wittgenstein's claim that the gloves can be made to cover one another in a four-dimensional space squares well with my point that he is drawing attention to the network. That the gloves can be made to cover one another in a different space, e.g., a four dimensional one, shows that the inability to cover one with the other lies with our method of representation, not with the what we are actually representing. Thus, contrary to Fogelin's interpretation, Wittgenstein is not saying that the inability to make two gloves coincide is contingent. Rather he is saying that the ability or inability will be a logical necessity depending on what method of representation is being used.

After discussing two examples which are usually thought to be synthetic *a priori* statements, Wittgenstein continues the discussion of causality started in remarks 6.36 and 6.361. Recall that at 6.361, Wittgenstein states that

In the terminology of Hertz we might say: Only *uniform* connexions are *thinkable*.

We saw that this remark squares well with Wittgenstein's comment that "We cannot think anything unlogical, for otherwise we should have to think unlogically" (3.03) as well as his comment that "we could not say of an 'unlogical' world how it would look" (3.031). Thus just as "we could not *say* of an 'unlogical' world how it would look" we could not *say* of a lawless world how it would look. Keeping these remarks in mind is helpful when considering Wittgenstein's next remark:

What can be described can happen too, and what is excluded by the law of causality [*Kausalitätsgesetz*] cannot be described (6.362).

The first part of this remark is similar to 3.02, where Wittgenstein comments that "What is thinkable is also possible". We cannot think anything unlogical and we cannot *say* of an unlogical world what it would be like (3.03 and 3.031). What we can *say* (or describe) is *possible*, or in Wittgenstein's words at 6.362, what can be described can happen. It seems, then, that what is excluded by the law of causality would be something that is not uniform or not law-like. Yet since we can only *think* uniform connections, we can only *describe* uniform connections. Thus what is not uniform or law-like, and therefore excluded by the law of causality, cannot even be described.

Black summarizes Wittgenstein's comments on causality as follows:

With respect to the 'law of causation', Wittgenstein's view seems to be that it is a prescription for the most general form of language compatible with the aims of science. Taken as something sayable, determinism would have to be equivalent to the pseudo-assertion, 'There are laws' (6.36*a*). Construed rightly, as a prescription for the syntax of a language of science, the 'law of causation' is so fundamental that what it excludes cannot be described at all (6.362) (Black, p. 361).

I think it is right that Wittgenstein would see the determinist's claim, "There are laws" as a pseudo-assertion. But determinism is a general philosophical issue and does not arise only in science. I think Wittgenstein is also thinking of the law of causality as something like "Every event has a cause". Again, this is not just a claim that arises in philosophy of science, but also philosophy in

general. Indeed, it follows from "Every event has a cause" that "There are laws" and vice versa. I think Wittgenstein's point is that both of these claims are senseless, and when we consider them both, his point can be seen as much richer and more in keeping with his general task of showing the limits of the expression of thoughts. It is not just that the law of causality is a prescription for the syntax of the language of science. It is also that "only *uniform* connexions are *thinkable*". We could not *describe* an unlogical world or a world which was not law-like. This is a *logical* point and Wittgenstein is showing us the limits of thought by showing us the limits of the *expression* of thoughts (what can be described). We cannot say of an unlogical world what it would be like any more than we can say of a lawless world what it would be like. This, however, is not an informative, or synthetic, *a priori* claim about the world, nor an epistemological claim about what we are capable or incapable of knowing. Rather, it is a point about our method of representation, not just in science, as Black contends, but in general.

#### *XIV. Induction and Causality*

In Section III, we saw that for Wittgenstein, the so-called law of induction is neither a logical law nor an *a priori* law, but a significant proposition (6.31). However, I noted that Wittgenstein did not tell us exactly how the "so-called law of induction" is to be construed as a significant proposition, but only that it was one. In 6.363 to 6.3611, Wittgenstein expands the notion of induction introduced at 6.31 and relates it to his view of causality.

The law of induction is usually understood as a law which legitimates our inference that the future resembles the past, or the inference from a finite number of past instances of an event, to a future instance. It is, as I mentioned in Section III, one of the main methods used in science. In Section IX, I argued that Black seems to find McGuinness's interpretation of the laws of science as truth-functions (stated within the framework of the net) unacceptable because he sees truth-functions as comprised of logical sums or products which are finite, and thus the predictive nature of scientific laws cannot be accounted for. The problem Black alludes to is that an *infinite* number of propositions can be generated from scientific laws and a truth-functional view of them only allows for *finite* logical products or sums. We also saw in Section XI that the problem Proctor wanted to attend to was the predictive power of science. In this section I will argue that given Wittgenstein's conception of induction, the criticism that a scientific law (understood as an empirical generalization capable of being either true or false) cannot be a truth-function because it does not allow for an infinite number of predictions, does not apply.

Wittgenstein begins by telling us that,

The process of induction is the process of assuming the *simplest* law that can be made to harmonize with our experience (6.363).

When Wittgenstein describes induction as a *process* (*Der Vorgang der Induktion*), he does not mean

that the process is a significant proposition. Rather, he means that by assuming the "*simplest law*" (*einfachste Gesetz*) that harmonizes with our experience, we shall formulate a significant proposition which can be either true or false. Thus when Wittgenstein tells us that the so-called law of induction is a significant proposition, we must understand him as saying that induction itself is a process in which we assume a particular law from which we will then be able to formulate a significant proposition.

Contrary to Black, I do not see any discrepancy between remark 6.31, which states that the so-called law of induction is a significant proposition and 6.363, which states that induction is a process. Black writes,

It will be noticed that the present remark does not square with the earlier one. Previously, W. has called the law of induction a 'significant proposition', but now he seems to be treating it as a rule or procedure. It is not a 'significant proposition' that the simplest laws will obtain: if we cannot say that laws obtain (6.36*b*), we also cannot say that the simplest laws obtain. It would have been more consistent for W. to have said that the truth of induction shows itself (Black, p. 365).

It is important to stress that Wittgenstein, in 6.31, refers to the law of induction as a "so-called" law. Given this phrasing, I think that it is not correct to assume that Wittgenstein means that the "law of induction", as it has traditionally been understood, is a significant proposition. Wittgenstein is not saying that "The future resembles the past" is a significant proposition. Instead, we can expect Wittgenstein to be, at the outset, construing induction in a new way. And, as is clear from 6.363, he is. Induction is not a law at all; it is a process and processes are not capable of being either true or false. In this regard, Black's interpretation is correct. But what *is* capable of being either true or false, which Black overlooks, is the proposition which can be formulated according to the particular law we assume. It is for this reason that Wittgenstein would not have said that the "truth of induction shows itself", as Black suggests he ought to. As a process, induction is not a proposition of any sort

which can show anything. Within this process, however, particular laws which *can* be used to formulate significant propositions are assumed. The truth or falsity of such propositions, however, shows nothing about induction, since there is no logical relation between the process of assuming something and the truth or falsity of what follows from using the process.

That there is no logical relation between the process of assuming something and the actual truth or falsity of what follows from the assumption is highlighted by Wittgenstein's next remark.

He writes,

This process, however, has no logical foundation but only a psychological one<sup>40</sup>. It is clear that there are no grounds for believing that the simplest course of events will really happen (6.3631).

When Wittgenstein states that "there are no grounds [*Grund*] for believing that the simplest course of events will really happen", he means no *logical* grounds. That the sun will rise tomorrow, for example, is the simplest course of events which follows from the simplest law (the sun always rises) which accords with our experience (that it has always risen in the past) (6.363). But,

[t]hat the sun will rise to-morrow, is an hypothesis [*Hypothese*]<sup>41</sup>; and that means that we do not *know* whether it will rise (6.36311).

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<sup>40</sup> In *Wittgenstein's Lectures, Cambridge 1930-1932*, he is recorded to have discussed induction as follows:

Is induction justifiable? Someone might say: "Oh, it must be, because it makes things more probable". But again it is like the knob or tapering of the spiral [done by a workman who can choose to end it in a knob or a point (a particular style)]. We try to cover up the beginning of our reasoning; but actually reasoning never started (p. 104).

Here induction is likened to a style of thinking which is similar to 6.3631, which states that it is a process. In both cases, induction is not something which is capable of being "justified".

<sup>41</sup> In *Wittgenstein's Lectures, Cambridge 1930-1932*, he is noted as saying.

There is a different kind of generality which applies to hypotheses. A proposition can be verified; a hypothesis cannot, but is a law or rule for constructing propositions and looks to the future--i.e. enables us to construct propositions which say what will occur and which can be verified or falsified (p. 16).

It is unclear just how much Wittgenstein's views had changed by the 1930's, but this comment accords with Wittgenstein's view of assuming a law, which in this case would be a hypothesis, which functions as a rule for constructing propositions which can be true or false. It seems, however, that "The sun will rise tomorrow" is not the hypothesis, as stated in 6.36311, but is the actual proposition since it is with the hypothesis that we can construct a proposition "which say[s] what *will* occur and which can be verified or falsified" (my italics). It should be remembered, however, that these are lecture notes, and not Wittgenstein's words verbatim.

We do not know whether the sun will rise because

A necessity for one thing to happen because another has happened does not exist. There is only *logical* necessity (6.37).

That induction has no logical foundation stems from Wittgenstein's view that there is only logical necessity<sup>42</sup>.

Wittgenstein's view that there is only logical necessity can be traced back to his conception of logic, his commitment to analysis and his view that sense must be determinate. Together, these conceptions give rise to his view of causality and inference. In his Introduction, Russell aptly states the way in which the status of causality is determined by Wittgenstein's logic. He writes,

The fact that nothing can be deduced from an atomic proposition has interesting applications, for example, to causality. There cannot, in Wittgenstein's logic, be any such thing as a causal nexus (p. 16)<sup>43</sup>.

Given Wittgenstein's conception of elementary propositions as independent, nothing can be deduced from them. As independent propositions, with no necessary connection to other elementary propositions, there can exist no causal nexus, since such a causal nexus requires an internal, necessary connection between propositions. On this view, all inference takes place *a priori* and belongs to the realm of the logical. And "[a] necessity for one thing to happen because another has happened does not exist. There is only *logical* necessity" (6.37).

In logic, the necessity that occurs between propositions occurs only between propositions which have elementary propositions as their truth-arguments (5.01), but not between two elementary

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<sup>42</sup> This kind of induction goes from past observations to a future observation. It is different in kind from that discussed in Section III. Russell's example in that section went from samples in the past to a generalization (law). Wittgenstein's point is the same, however, insofar as the "so-called law of induction" is not a logical law in either case. The difference is the status of a general law (e.g. a law of motion) versus the status of a particular proposition (e.g. "The sun will rise at 6:45 a.m."). The former, if it is part of science is not a candidate for truth and falsity, while the latter is.

<sup>43</sup> Russell uses 'atomic proposition' rather than 'elementary proposition'.

propositions, which are independent. The inference of  $p$  from  $q$  is justified by the propositions  $p$  and  $q$  alone (5.132), meaning that such an inference is purely a logical one since "[t]he truth-grounds of  $q$  are contained in those of  $p$ " (5.121). But since elementary propositions are independent, the truth-grounds of one cannot be contained in another. This means that all inference takes place *a priori* and belongs to the realm of the logical, and nothing can be deduced from elementary propositions. The necessity required by causality, then, is purely logical and there is "no causal nexus" (5.136). Thus while there may be causal regularities in the world, these regularities are purely contingent.

What we have discussed so far is based on the fact that in Wittgenstein's logic, elementary propositions are independent. The fact that elementary propositions must be independent can be traced back to Wittgenstein's initial commitment to analysis. It is only after one is committed to analysis that "[i]t is obvious that in the analysis of propositions we must come to elementary propositions, which consist of names in immediate combination" (4.221). Thus we see that it is a requirement of analysis that complex propositions reduce to simpler elementary propositions, which are combinations of names in immediate combination.

But analysis alone does not by itself require a termination point, nor the *independence* of elementary propositions. Instead, it is Wittgenstein's further commitment to sense being determinate which leads to the view that there must be objects or simples which are the substance of the world from which it then follows that elementary propositions must be independent. At 2.021 Wittgenstein's commitment to sense being determinate is clear as he states, "If the world had no substance [no simple objects], then whether a proposition had sense would depend on whether another proposition was true". If the sense of a proposition depended on whether or not another proposition were true, analysis would continue ad infinitum and sense would not be determinate, but

indeterminate. For sense to be determinate, there must be substance, or simple objects so that the sense of a proposition is independent of the truth (or falsity) of another proposition and analysis has a definite termination point.

Given that there must be simple objects, it follows that the elementary proposition, understood as a concatenation of names which name these simple objects, is independent since its sense is a matter of "its agreement or disagreement with the possibilities of the existence and non-existence of the atomic facts" (4.2) and *not* a matter of whether or not another proposition is true. Since atomic facts are concatenations of simple objects and "are independent of one another" (2.061), elementary propositions which picture them must also be independent of one another. Thus we see that if one is committed to analysis then propositions can be analyzed into simpler and simpler propositions, and if sense must be determinate then this analysis must terminate in propositions the names of which name simple objects. From this it follows that elementary propositions, which picture atomic facts, must be independent of one another.

Given what I have said so far, we can see that it follows from the independence of elementary propositions that there can be no causal nexus and that all inference takes place *a priori* since the only necessity that exists is logical necessity. Wittgenstein's remarks at 6.3631 to 6.37 recapitulate 5.135 to 5.1361, which run:

In no way can an inference be made from the existence of one state of affairs to the existence of another entirely different from it (5.135).

This is so because, as we have seen, elementary propositions are independent. And,

There is no causal nexus which justifies such an inference (5.136).

Thus,

The events of the future *cannot* be inferred from those of the present (5.1361).

That the sun will rise tomorrow cannot be inferred from the fact that it has risen this morning. While we may assume the law "The sun always rises" based on experience, there is no logical relation between the past and the future. But that the sun will rise tomorrow is a significant proposition. Its truth-value rests solely on whether it in fact does rise, not on whether or not it has risen in the past. It is in this way that Wittgenstein means that the "so-called law of induction" is a significant proposition; namely, that by the process of induction, we can formulate significant propositions.

At the beginning of this section, I said that Wittgenstein's conception of induction shows that his notion of empirical generalizations as truth-functions does not conflict with science, especially its predictive aspect. Recall that for Black, it seems that Wittgenstein cannot account for the predictive nature of science insofar as truth-functions are finite, whereas laws may generate an infinite number of predictions. We have seen that Wittgenstein's view of induction as a process which has no logical foundation, follows from his view of the independence of elementary propositions and his view of inference. His point is that induction is not part of logical research. It is in this way that he is making clear what belongs to logic, and says nothing, and what does not and can be a significant proposition. His discussion of science in the 6.3s, then, is not to tell us how we actually operate in science, still less to give a philosophical explanation of induction, which is a psychological process and has nothing to do with philosophy as he views it.

There is, however, also a more detailed answer that can be given to Black. The problem with truth-functions as Black conceives of them only arises with empirical generalizations which can be true or false. This is because Black concedes that the laws of the network are not capable of being true or false and are not truth-functions. If the net is a plan from which an infinite number of possible propositions which *are* significant can be formulated, then Wittgenstein has no trouble

accommodating them, since the laws which comprise the net are not truth-functions. With empirical generalizations, which are truth-functions understood as finite logical sums or products, we may assume that they hold for the future, but that just means that we have engaged in a psychological process and there is no logical connection between our assumption and the particular proposition, which may be true or false. Wittgenstein's view of laws -- be they part of the net and not truth-functions, or assertions within the net that are truth-functions -- is perfectly consistent with the predictive nature of science. The point to be remembered is that what is capable of being true or false is *purely a posteriori* and since induction has no logical foundation, it is not an *a priori* truth, let alone an informative, or synthetic, *a priori* truth.

## XV. *Explanation*

I have been arguing that part of Wittgenstein's focus in the 6.3s is to show that there are no informative, or synthetic, *a priori* truths. This is integral to his task, stated in his Preface, of showing us the limits of the expression of thoughts. Propositions which are normally thought of as *a priori* and informative belong to either logical investigation, in which case they are analytic, *a priori* and empty statements, or to scientific investigation, in which case they are synthetic, *a posteriori* and accidental statements, capable of being either true or false and having nothing to do with philosophy. The law of causality and other such laws can be understood as *a priori* intuitions or forms of laws which say nothing about the world. The law of induction is not even a law, but a psychological process which allows us to formulate particular propositions which can be true or false. Natural laws, such as Newton's laws, belong to the net, which is *a priori* and say nothing about the world. Other laws which have an empirical component, such as Newton's law of gravitation, are significant propositions, but are stated within the framework of the *a priori* net. We are to see, then, that what is *a priori* is wholly *a priori* and can say nothing about the world, while what does say something about the world is related to the *a priori* only insofar as it is framed within an *a priori* net. Thus it is wholly contingent. In terms of what "can be said clearly", we are limited to accidental propositions which can in no way be *a priori*. *A priori* "propositions" say nothing at all and "whereof one cannot speak thereof one must be silent" (*Tractatus*, p. 27).

That there are no informative *a priori* statements is not just a prejudice or unwarranted conclusion on Wittgenstein's part. As we have seen, his view of the law of causality as the form of a law as well as causality itself, follows from his notion of the proposition as a truth-function and the independence of elementary propositions. Likewise, that induction is in no way related to logic

and that there is only logical necessity can be traced back to the independence of elementary propositions and the non-existence of a causal nexus. The *a priori* nature of the net follows from its relative position to logic and the fact that the laws which comprise it (Newton's laws, for example) do not picture and are not candidates for truth or falsity since they are not truth-functions.

At 6.371, Wittgenstein tells us:

At the basis of the whole modern view of the world lies the illusion that the so-called laws of nature [*sogenannten Naturgesetze*] are the explanations [*Erklärungen*] of natural phenomena.

Here Wittgenstein makes an additional point about metaphysics. The modern view of the world embraces the laws of nature as the *explanations* of natural phenomena. For Wittgenstein this is an illusion which causes people to

...stop short at natural laws [*Naturgesetzen*] as at something unassailable, as did the ancients at God and Fate.

And they both are right and wrong. But the ancients were clearer, in so far as they recognized one clear terminus, whereas the modern system makes it appear as though *everything* were explained [*erklärt*] (6.371).

Taking the so-called laws of nature as explanations of natural phenomena is an illusion (*Täuschung*), according to Wittgenstein, which leads the Moderns to see them as unassailable (*Unantastbar*). The Ancients did not take the so-called laws of nature to be unassailable, but instead see God or Fate as unassailable. Wittgenstein tells us that both are "right and wrong".

Wittgenstein tells us that the Ancients are clearer since they recognize "one clear terminus". Unlike the Moderns, they do not make the mistake of thinking that the so-called laws of nature explain "*everything*". Thus the Ancients are right to recognize that the so-called laws of nature do not explain everything, while the Moderns are wrong because they think that they do. Why is this so? If we think of the Moderns as taking the so-called laws of nature to be the law of causality and

the law of least expenditure, etc., it is clear given Wittgenstein's discussion that they *explain* nothing since they are not significant propositions. Likewise, the laws which comprise a net explain nothing since they are *a priori*. What is more, since every significant proposition conforms to the framework of a net, there is no getting outside of a method of representation in a way which would explain *everything*. Now, according to Wittgenstein, the Ancients do not commit this error, and instead posit God or Fate as unassailable explanations. But while it is right not to take the so-called laws of nature as explanations of everything, it is wrong to posit God or Fate as unassailable explanations. This is so because positing something outside of a particular method of representation, e.g., outside a net, makes no sense. There is no explanation outside of all methods of representation; what lies outside a method of representation is "simply nonsense" (p. 27). Thus while the Ancients are right to recognize that the laws of nature do not explain everything but wrong to posit God or Fate as unassailable explanations, the Moderns are right to recognize that such an explanation makes no sense and that science in some way does explain, but wrong to take the laws of nature as an unassailable explanation.

Some commentators think that Wittgenstein is claiming that science in no way explains.

Black, for example, writes,

If this [6.371] is treated as a comment on the preceding remark [6.37: "There is only logical necessity"], we might infer that W. held some *necessary* connexion to be required for a genuine explanation.

W.'s attitude towards the concept of explanation is distinctly unsympathetic. To insist that a genuine explanation must, *per impossible*, demonstrate a necessary connexion between natural phenomena is to make an unconscionable demand and to ignore how explanation is actually used, in science and elsewhere. It is not unfair to say that in his brief remarks about explanation (as well as about induction and causality) W. merely exposes a rationalistic prejudice (Black, pp. 365-366).

According to Black, Wittgenstein is claiming that a necessary connection, or a logical necessity, is

required for there to be genuine explanation. I think this is wrong for two reasons. First, if only necessary connexions provide us with genuine explanations, then logic itself provides us with genuine explanation. Yet this is clearly not what Wittgenstein is claiming. For Wittgenstein, as we have seen, logic is empty and says nothing. Thus logic cannot provide us with any kind of explanation. Second, Black's interpretation forces on Wittgenstein the view that science in no way explains, since the propositions of science, which we are to understand as significant propositions, are not necessary, but contingent. I think that Wittgenstein does think that science explains<sup>44</sup>. His point is not that science does not explain because it does not meet the criterion of necessary 'propositions'. Rather, his point is that so-called genuine explanation, understood as unassailable 'propositions', makes no sense -- first because we cannot get outside of all methods of representation and second because there are no informative *a priori* truths. Science does explain; we use nets to explain phenomena. But laws such as the law of causality, as well as the networks themselves, do not explain since they are *a priori* and say nothing about the world.

In contrast to Black, Mounce does not interpret Wittgenstein as eschewing all explanation. For Mounce, the Ancients and the Moderns are both right because science does in some sense

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<sup>44</sup> My point that for Wittgenstein science does explain is highlighted in the following remark taken from *Wittgenstein's Lectures, Cambridge 1930-1932*. In addition, the difference between philosophy (which is logical investigation for Wittgenstein) and science is also highlighted, as well as my earlier point that logic in no way explains:

1. If we explain an event in physics, we explain it by describing another event. Thought is an event, and in psychology we can give a similar explanation of thoughts by describing other thoughts. If we say that in philosophy we don't want *explanation* of thought but an *analysis*, this is also misleading. When we analyse in science we describe some further event. In chemistry we analyse water and find that its chemical composition is H<sub>2</sub>O; we find out something new about it. Analysing here means finding something new. But this is not what we mean by analysis in philosophy. In philosophy we know already all that we want to know; philosophical analysis does not give us any new facts. It is not the results of science which are of interest to philosophy but its methods. Philosophical analysis does not tell us anything new about thought (and if it did it would not interest us) (D. Lee, ed., pp. 34-35).

In this remark, we see that while science explains and provides an analysis, philosophy does not (while analysis takes place in philosophy, it is not the sort which takes place in science). Although these are lecture notes which are taken in the 1930's, this remark seems in keeping with the *Tractatus* view of logic insofar as nothing new is revealed in logic and logic is not a science (see, for example, 6.1251 and 6.111). I consider this remark a good indication that Wittgenstein did think that science explained in the sense that explanations are given by describing other events. (This may also be applied to 6.3611).

explain; for example, "[o]ne may explain fire's burning in the sense of linking this fact to others, and, in particular to other regularities" (Mounce, p. 74). The Moderns are wrong, however, in the sense that the "[l]aws of nature, in short, summarize experience; they do not explain it" (Mounce, p. 74). According to Mounce, the laws of nature do not explain since other facts or regularities are left unexplained and the process of linking facts together is either infinite or there is some "set of facts which is ultimate and therefore itself inexplicable" (Mounce, p. 75). In this sense the Ancients were clearer, since, by referring ultimately to God (something inexplicable) they were not deluded into thinking that they had explained everything (Mounce, p. 75).

There is something right in Mounce's interpretation, but also something wrong. It seems right that the Ancients were clearer than the Moderns insofar as they did not delude themselves into thinking they had explained everything. But it seems wrong that the laws of nature do not explain *because* the process of explanation is *infinite* or *because* there is some ultimate explanation that is itself inexplicable (God).

First, in Wittgenstein's example of the net, recall that what characterizes the picture is "the fact, namely, that it can be *completely* described by a definite net of *definite* fineness" (6.342). Insofar as the net is *complete*, it gives us all the propositions possible to describe the picture. A particular method of representation in science, such as Newton's, is thus in no way incomplete in the sense that Mounce's use of the word 'infinite' alludes. Every proposition which can be true or false can be formulated. We might go on formulating such propositions indefinitely, but Newton's system remains complete.

Second, Mounce does not tell us why the Ancients were wrong to posit God as the ultimate, inexplicable explanation. When claiming that "it is impossible to explain everything", he assumes

that this is because an ultimate explanation would have to rest on something that "is itself inexplicable" (Mounce, p. 75). While right to recognize that the Ancients were at least not deluded into thinking that they had explained everything, Mounce fails to recognize that Wittgenstein is not saying this because he thinks that a full explanation would have to be "itself inexplicable" -- for this would make the Ancients *right* to posit God as the ultimate, inexplicable explanation. Rather, Wittgenstein is showing us the limits of our thought by showing us the limits of our language. Outside this limit is *not* an explanation that is itself inexplicable, but rather "what lies on the other side of the limit will be simply nonsense" (p. 27). In this light, the Moderns are *right* to think that the laws of nature explain, for they do, but the Moderns are *wrong* if they think they are in any way getting 'outside' of logic or 'outside' of the axioms of, for example, mechanics. The Ancients were *right* to think that the laws of nature do not provide an ultimate explanation, but *wrong* to think that a position outside all methods of representation exists at all, for it is "simply nonsense".

Lastly, Parkinson holds the view that the laws of nature do not explain. They do not explain because they *describe*. As we have seen, the laws of nature describe in the sense that they provide a "*way of talking* about the world" (Parkinson, p. 69). Yet given Parkinson's interpretation, the laws of nature in *no way* explain, and this does not seem at all to be what Wittgenstein says at 6.371 and 6.372. In this light, Parkinson's interpretation falls short of telling us why Wittgenstein writes that the Moderns and the Ancients "both are right and wrong" (6.372). Contrary to Parkinson, I argued earlier that the laws of nature explain precisely because they provide a "way of talking about the world". We explain phenomena by using a net. But we should not conflate what it is that we use to explain phenomena, i.e., a method of representation, with an *explanation* of a method of representation. To explain anything we require a method of representation; there is no explanation

that is outside all methods of representation.

## XVI. *An Ethical Side to the Limits of Science*

To many modern thinkers, science ought to be given a much grander status than Wittgenstein seems to allow. Black, for example, writes,

This is surely an excessively sceptical and deflationary view of the achievements and capacities of science. Like other rationalists, Wittgenstein is content with nothing less than the certainty to be found in logic and mathematics--and downgrades the natural sciences accordingly (Black, p. 364).

Black's comment is a surprising misinterpretation of Wittgenstein. What Black fails to grasp is that Wittgenstein in no way disparages science because it does not have the certainty that logic and mathematics do. Indeed, if science *did* have the certainty that logic and mathematics do, it would say nothing. For Wittgenstein, logic and mathematics are not 'better than' science -- quite the opposite, he has been showing us that logic says nothing and that mathematics is comprised of equations or pseudo-propositions. What Wittgenstein has been showing us is the way in which it is possible for science to in fact say something about the world while at the same time insisting that there are no informative *a priori* truths to be gleaned from logic *or* science. Contrary to Black's view that Wittgenstein is a rationalist, Wittgenstein deprecates the certainty of logic and mathematics heralded by rationalists by claiming that both are empty.

By showing the limits of science, Wittgenstein is giving science a humble status, but not for the reason that Black claims. Wittgenstein would not deny the achievements of science insofar as they are *scientific* achievements, but he would challenge any view which claimed any other kind of status for them, i.e. any status greater than a scientific one. Science, for example, cannot be used to say anything about God or religion. As Anscombe writes

...the truth of the *Tractatus* theory would be death to natural theology; not because of any jejune positivism or any 'verificationism', but simply because the picture theory of the 'significant proposition'. For it is essential to his theory that the

picturing proposition has two poles, and in each sense it represents what may perfectly well be true. Which of them is true is just what *happens* to be the case. But in natural theology this is an impermissible notion; its propositions are not supposed to be the ones that happen to be true out of pairs of possibilities; nor are they supposed to be logical or mathematical propositions either (Anscombe, p. 78).

It is the non-existence of synthetic *a priori* truths which causes the death of natural theology. As Anscombe points out, natural theology is not made up of propositions which "happen to be true out of pairs of possibilities" (contingent propositions), but propositions which are *a priori* and informative (synthetic). Since the only *a priori* propositions for Wittgenstein are either logical, (and empty) or mathematical (which are pseudo-propositions), science, which is comprised of contingent propositions, deals with "what *happens* to be the case" and cannot be used in natural theology, which seeks informative *a priori* propositions.

Yet while we cannot prove the existence of God through science, we equally cannot use science to disprove His existence. Thus those who wish to applaud the death of natural theology in favour of an atheistic world view based on science are equally mistaken. Science tells us only *how* the world is and "is completely indifferent to what is higher" (6.342). So the death of natural theology in no way means that science can *disprove* the existence of God. The point of the 6.3s, and the *Tractatus* as a whole, is to show the limits of science, not to glorify science. In *Lectures on Aesthetics and Religion*, Wittgenstein's thoughts accord well with the *Tractarian* account of science that we have been looking at:

Jeans has written a book called *The Mysterious Universe* and I loathe it and call it misleading. Take the title...I might say the title *The Mysterious Universe* includes a kind of idol worship, the idol being Science and the Scientist (*Lectures & Conversations*, p. 27).

Given Wittgenstein's discussion in the 6.3s, science and the scientist are engaged in no more than telling us *how* the world is.

For Wittgenstein, it is "[n]ot *how* the world is [that] is the mystical, but *that* it is" (6.44). No mystery can be uncovered by discovering *how* the world is. Contemplating *that* the world is as opposed to *how* it is, is the contemplation of the world as a limited whole, *sub specie aeterni* (6.45). But contemplating the world as a limited whole is a futile attempt to view it outside of any method of representation. Although logic is before the How, that is, before science, it is not before the What. As Wittgenstein tells us at 5.552,

The "experience" which we need to understand logic is not that such and such is the case, but that something *is*; but that is *no* experience.  
Logic *precedes* every experience--that something is *so*.  
It is before the How, not before the What.

Thus logic is before something being *so*, but not before something *being*. The attempt to view the world *sub specie aeterni*, then, is the impossible attempt to step outside of logic, that is, outside of anything *being*. It is for this reason that

...even if *all possible* scientific questions be answered, the problems of life have still not been touched at all. Of course there is then no question left, and just this is the answer (6.52).

What can be answered are questions about the How -- these are scientific questions -- but not so-called questions about the What (*that* the world is). Thus arguments from science both for God *and* against God can be seen as resting on a misunderstanding of the logic of our language, first, that there are no informative, or synthetic, *a priori* statements and, second, that science tells us only How the world is. Since "God does not reveal himself *in* the world", the question of the existence or non-existence of God is not a "possible" scientific question<sup>45</sup>. Questions which are not possible scientific

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<sup>45</sup> On this view, both cosmological arguments and scientific views which purport to show the falsity of the cosmological argument are confused. Arguing that God exists because the universe must have a cause is as mistaken as arguing that there cannot be a God because Stephen Hawking's version of the Big Bang theory shows that the universe is uncaused. Both views are based on the illusion that the laws of nature, be they the law of causality or Quantum Mechanics, are capable of telling us not just how the world is, but that it is.

questions are not questions at all, and it is for this reason that "there is then no question left".

It should be noted that when Wittgenstein speaks of scientific questions or propositions of science he is not just thinking of the propositions stated within the framework of Newtonian mechanics, but of any significant proposition, any proposition capable of being either true or false. On this view, he is not saying that only the propositions of science *proper* (e.g., physics) are significant. But his comments regarding the limits of what can be said apply both to a narrow or a broad conception of science. Most importantly, we are to see that while every question that can be *asked* is one which can be answered, this does not mean that science can answer 'everything' -- some questions are not "possible questions" which can be asked at all. There are certain 'questions' such as the existence or non-existence of God, which science (construed narrowly or broadly) can in no way purport to answer since they are not questions at all. Neither philosophy nor science can attempt to ask or answer these 'questions'. This is one of the ways that Wittgenstein's work is ethical in nature. Showing us the limits of what can be said, i.e., what can be asked and answered is an ethical task which enables us to cease worshipping mistaken idols and attempting to say what cannot be said.

Another way in which the *Tractatus* is ethical in nature can be found in all that it does not contain. Wittgenstein does not, for example, pronounce on whether or not God exists nor what the meaning of life is. To remain silent on the issues which have filled philosophy texts over the centuries is to conduct oneself in an ethical manner. As Wittgenstein writes to a prospective publisher of the *Tractatus*:

...the point of the book is ethical. ...I wanted to write that my work consists of two parts: of the one which is here, and of everything which I have *not* written. And precisely this second part is the important one. For the Ethical is delimited from within, as it were, by my book; and I'm convinced that, *strictly* speaking, it can

ONLY be delimited in this way. In brief, I think: All of that which *many* are *babbling* today, I have defined in my book by remaining silent about it (*Wittgenstein: Sources and Perspectives*, pp. 82-98).

And as Wittgenstein writes in his Preface: "Whereof one cannot speak, thereof one must be silent" (p. 27). But to say that a question cannot be asked because it makes no sense is not to say that the question has in any way been answered. For this reason, providing a proper understanding of the logic of our language "shows how little has been done" (p. 29).

## XVII. Summary

Wittgenstein's discussion in the 6.3s is in keeping with his general task, as set out in the Preface, of showing us "what can be said clearly" and where "one must be silent" (p. 27). Philosophy, understood as logical investigation, is not a science, but functions to "limit the disputable sphere of natural science" (4.113). With a correct understanding of the logic of our language many philosophical problems are dissolved. Understanding that propositions are truth-functions of elementary propositions and that elementary propositions are independent of one another shows that there is no causal nexus. Understanding the proposition as a picture and recognizing the difference between formal concepts and proper concepts shows that the law of causality is the form of a law and not a proposition which says something about the world. Problems surrounding induction are dissolved once it is understood that there is no causal nexus and that all inference takes place *a priori*. Issues surrounding the relative position of logic and mechanics, the status of the laws of science, the true propositions of science, logical necessity versus contingency and the nature of explanation likewise dissolve given Wittgenstein's conception of logic.

By showing that epistemology has no place in philosophy and that there are no informative *a priori* truths, Wittgenstein highlights the purely elucidatory nature of philosophy as he conceives it as opposed to a philosophy which purports to provide us with substantial claims. Yet while he claims that it is only the propositions of science which actually say anything, Wittgenstein in no way glorifies or idolizes science. Thus while philosophy is shown to be only elucidatory, science is shown to deal only with the contingent.

I hope it is clear that in the 6.3s Wittgenstein is not just dealing with science, nor with leftover problems. His discussion is consistent with the rest of the *Tractatus* and is a continuation

of the task he sets himself in his Preface. Nor is this task just a logical one; it is an ethical one as well. But the 6.3s is much more than merely consistent with the aims of the *Tractatus* -- it is by itself a rich discussion of many philosophical issues, as we have seen. The wide scope of Wittgenstein's logic could only add to its power and allure. Small wonder, then, that Wittgenstein felt that "the truth of the thoughts communicated" in the *Tractatus* were "unassailable and definitive" and "that the problems have in essentials been finally solved" (p. 29).

## Bibliography

- Anscombe, G.E.M. *An Introduction to Wittgenstein's Tractatus*, 2nd edition. London: Hutchinson & Co. Ltd., 1963.
- Besansçon, R.M., ed. *The Encyclopedia of Physics*. New York: Van Nostrand Reinhold Company, 1974.
- Barrett, C., ed. *Wittgenstein, Lectures & Conversations on Aesthetics, Psychology and Religious Belief*. Berkeley: University of California Press, 1966.
- Bynum, W.F., E.J. Brown and R. Porters, eds. *The Dictionary of the History of Science*. Princeton: Princeton University Press, 1981.
- Black, M. *A Companion to Wittgenstein's 'Tractatus'*. Ithaca: Cornell University Press, 1964.
- Fogelin, R.J. *Wittgenstein*, 2nd edition, T. Honderich, ed. London: Routledge & Kegan Paul Ltd., 1987
- Griffin, J.P. *Wittgenstein's Logical Atomism*. Seattle: University of Washington Press, 1969.
- Hacker, P.M.S. *Insight and Illusion*. Oxford: Clarendon Press, 1972 (first edition) and 1986 (revised edition).
- Hacker, P.M.S. *Wittgenstein's Place in Twentieth-Century Analytic Philosophy*. Oxford: Blackwell Publishers Ltd., 1996.
- Kant, I. *Critique of Pure Reason*, N.K. Smith, trans. New York: St. Martin's Press, 1965.
- Kant, I. *Prolegomena to Any Future Metaphysics*, G. Hatfield, trans. Cambridge: Cambridge University Press, 1997.
- King, J. and D. Lee. *Wittgenstein's Lectures, Cambridge, 1930-1932*, D. Lee, ed. Oxford: Basil Blackwell, 1980.
- Luckhardt, C.G., ed. *Wittgenstein: Sources and Perspectives*. Ithaca: Cornell University Press, 1979.
- McGuinness, B.F. "Philosophy of Science in the Tractatus" in *Wittgenstein et le problème d'une philosophie de la science*. Colloques Internationaux du Centre national de la recherche Scientifique, Aix-en-Provence, France. July 21-26, 1969, pp. 9-20.
- Mounce, H.O. *Wittgenstein's Tractatus*. Chicago: University of Chicago Press, 1981.

Parkinson, G.H.R. *Saying and Showing, An Introduction to Wittgenstein's Tractatus Logico-Philosophicus*. Milton Keynes: The Open University Press, 1976.

Proctor, G.L. "Scientific Laws and Scientific Objects in the 'Tractatus'" in *Essays on Wittgenstein's Tractatus*, I.M. Copi and R.W. Beard, eds. New York: Hafner Press, 1966, pp. 201-216.

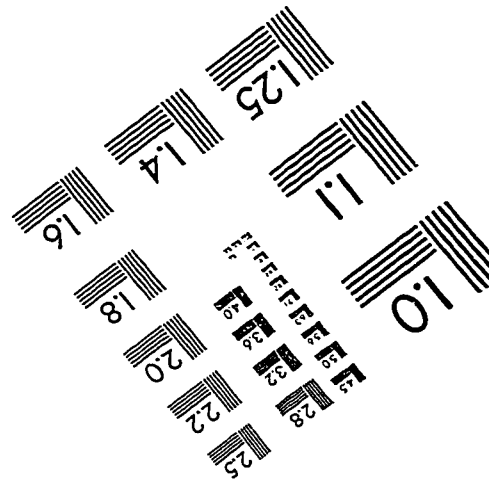
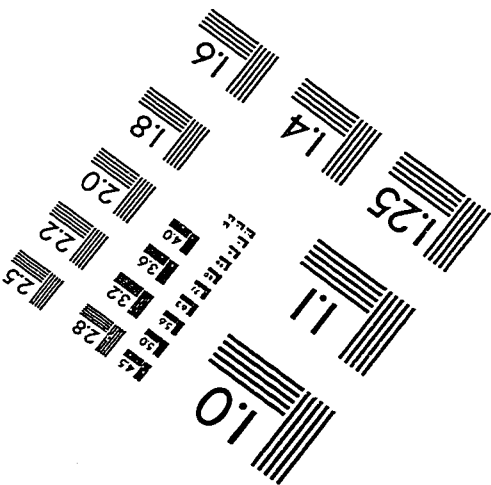
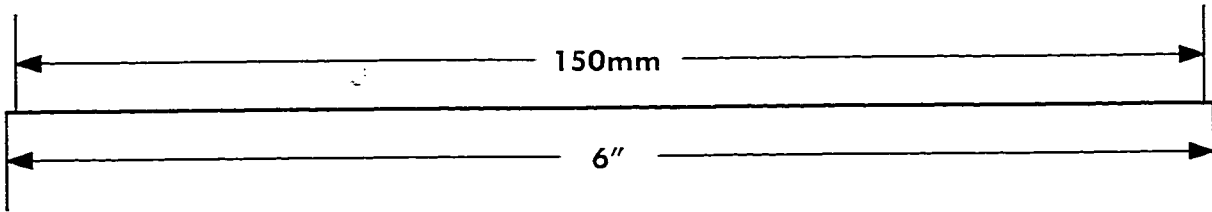
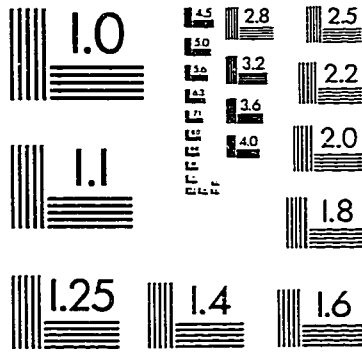
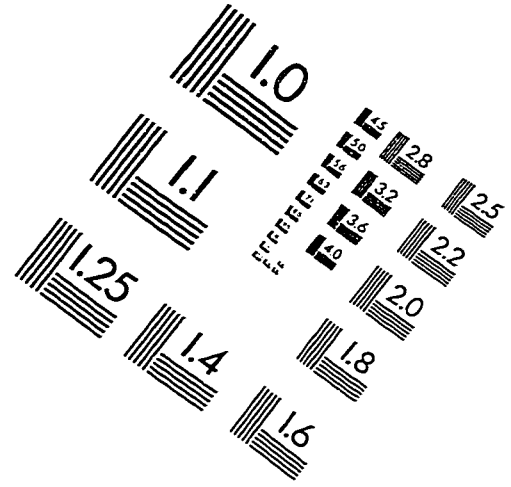
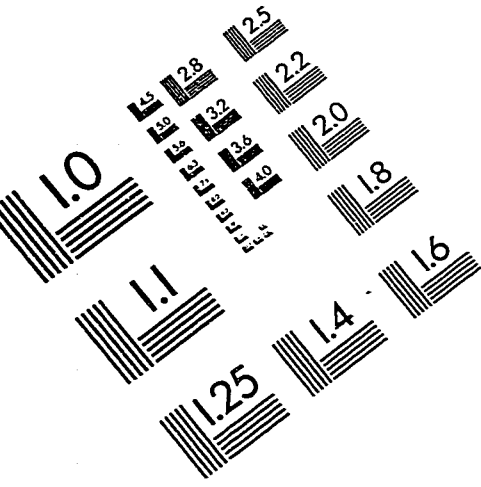
Wittgenstein, L. *Letters to C.K. Ogden*, G.H. von Wright, ed. London: Routledge & Kegan Paul, 1973.

Wittgenstein, L. *Letters to Russell, Keynes and Moore*, G.H. von Wright, ed. Oxford: Basil Blackwell, 1974.

Wittgenstein, L. *Notebooks 1914-1916*, 2nd edition, G.H. von Wright and G.E.M. Anscombe, eds., G.E.M. Anscombe, trans. Oxford: Basil Blackwell, 1979.

Wittgenstein, L. *Tractatus Logico-Philosophicus*, C.K. Ogden, trans. London: Routledge & Kegan Paul Ltd., 1922.

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