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Bipolarity and Sense in the *Tractatus*

Peter Hanks

Although the terms 'poles', 'bipolar', and 'bipolarity' do not appear in the *Tractatus*, it is widely held that Wittgenstein maintained his commitment to bipolarity in the *Tractatus*. As it is usually understood, the principle of bipolarity is that every proposition must be capable of being true and capable of being false, which rules out propositions that are necessarily true or necessarily false. Here I argue that Wittgenstein was committed to bipolarity in the *Tractatus*, but getting a clear view of this commitment requires a different understanding of bipolarity. Properly understood, bipolarity is the view that every proposition represents two possible states of affairs, one positive and the other negative. Of course, in the case of elementary propositions, the sense of a proposition is only the positive state of affairs. There is thus an asymmetry between what a proposition represents, its true-false poles, and what it says, its sense. In this paper I show how Wittgenstein accounted for this asymmetry in *Notes on Logic* and I consider two ways he might have accounted for it in the *Tractatus*.

Bipolarity and Sense in the *Tractatus*

Peter Hanks

1. Introduction

The idea that propositions are bipolar figures prominently in Wittgenstein's pre-*Tractatus* works. In *Notes on Logic* he puts the idea as follows:

Every proposition is essentially true-false: to understand it, we must know both what must be the case if it is true, and what must be the case if it is false. Thus a proposition has two *poles*, corresponding to the case of its truth and the case of its falsehood. (Wittgenstein 1913, 98-99)

The Moore notes and the *Notebooks* also contain frequent references to the poles of a proposition. The latest occurs on June 2, 1915, where Wittgenstein remarks that "my theory does not really bring it out that the proposition *must* have two poles," (Wittgenstein 1979, 53).

Surprisingly, there is no explicit discussion of bipolarity in the *Tractatus* and nowhere does he use the terms 'poles', 'bipolar' or 'bipolarity'. This raises a question about whether he remained committed to bipolarity in the *Tractatus*. The consensus among commentators is that he was so committed. I will argue that this is correct, but the matter is not as straightforward as it is usually taken to be. As we will see, the consensus is based on an impoverished understanding of what bipolarity amounts to, and once this misunderstanding is cleared up a problem arises. The problem is that, in the context of the picture theory of meaning, it is difficult

to see how Wittgenstein reconciles the bipolarity of propositions with the fact that they have sense. Properly understood, a proposition is bipolar insofar as it presents or represents two possible states of affairs, one positive the other negative.¹ But the sense of the proposition is only one of these two states of affairs. The elementary proposition ' aRb ' represents the possible positive state of affairs in which a bears R to b , and the possible negative state of affairs in which a does not bear R to b , but it only asserts the existence of the positive state of affairs. There is thus an asymmetry between what a proposition represents, its poles, and what it says, its sense. The problem I want to raise in this paper is a matter of understanding how Wittgenstein accounts for this asymmetry in the *Tractatus*.

2. What is bipolarity?

Bipolarity is widely understood to be the requirement that propositions must be capable of being true and capable of being false. For example, according to Hacker:

Although Wittgenstein's preoccupation that ordinary language is in good logical order committed him to the requirement of bivalence and the applicability of the Law of Excluded Middle, he adopted, in the course of his atomism, the much more radical position of Bipolarity for elementary propositions. This of course satisfies bivalency, but it goes much further, for it commits him to the unique position of denying that there are any necessary elementary propositions. Any proposition that has a sense must not just be capable of being true or false, it must be capable of being true and also capable of being false. (Hacker 1981, 96)

Similarly, Glock:

The only genuine propositions are pictures of possible states of affairs. These are bipolar — capable of being true but also capable of being false — and hence cannot be necessarily true. (Glock 1996, 199)

And Morris:

It is sometimes suggested that Wittgenstein's reasoning in the *Tractatus* turns fundamentally on a principle known as the Principle of Bipolarity. According to this principle, in its most general form, every meaningful sentence must be capable both of being true, and of being false. It is not enough merely that every sentence must be either true or false: that is the principle known as the Principle of Bivalence. The Principle of Bipolarity demands, not merely that each proposition must fall into one of the two categories, but that both categories must be, as it were, live options for every proposition. (Morris 2008, 133)²

Bipolarity, on this construal, is a stronger commitment than bivalence. Not only must every proposition be either true or false, but every true proposition must also be capable of being false and every false proposition capable of being true. This rules out propositions that are necessarily true or necessarily false.

I have no wish to challenge the claim that Wittgenstein was committed to what Hacker, Glock, and Morris call bipolarity in the *Tractatus* (see 2.225, 4.461-4.466). Rather, I deny that they have correctly captured the concept of bipolarity.³ The capacities for both truth and falsity are consequences of a deeper fact about propositions, and it is this deeper fact that should be identified with bipolarity. The deeper fact concerns the representational contents of propositions. A proposition *has* two poles in the sense that it *represents* both a possible positive state of affairs and a possible negative state of affairs. We find this idea in Anscombe, who puts

it by saying that a proposition has both a “positive sense” and a “negative sense”:

The picture-theory of the proposition is that the proposition in the positive sense says: ‘This is how things are’ and in the negative sense says: ‘This is how things aren’t’ — the ‘*this*’ in both cases being the same. (Anscombe 1959, 67)

Similarly, Black explains bipolarity as the idea that a proposition specifies both verifying and falsifying conditions:

W. liked to think of this ‘bi-polarity’ by imagining the proposition to draw a boundary in ‘logical space’, with the verifying conditions on one side and the falsifying conditions on the other. The need for a proposition to specify both falsifying and verifying conditions then appears as the truism that a boundary must have two sides to it. (Black 1964, 106-7)

These are both ways of capturing the thought that the representational content of a proposition includes two possible facts or conditions or states of affairs, one positive and the other negative. Before we see how this thought figures in the picture theory of meaning it will be useful to see how Wittgenstein explains bipolarity in *Notes on Logic*. The problem of the asymmetry of bipolarity and sense will emerge along the way.

3. Bipolarity and sense in *Notes on Logic*

Wittgenstein dictated *Notes on Logic* in the fall of 1913, roughly a year before he discovered the picture theory of meaning. Some central aspects of the picture theory are prefigured in *Notes on Logic*, in particular, the idea that elementary propositions are facts in which names are bound together by predicates.⁴ However, it is

important to see that the theory of sense in *Notes on Logic* is different in its essentials from the picture theory of the *Tractatus*.

Wittgenstein's theory of sense in *Notes on Logic* is built upon the idea that "the form of a proposition is like a straight line, which divides all points of a plane into right and left," (Wittgenstein 1913, 102). By "form of a proposition" Wittgenstein meant a linguistic predicate with argument places, e.g. ' xRy '.⁵ He makes this clear in the following remark, where he offers a "definition of sense":

The form of a proposition has meaning in the following way. Consider a symbol " xRy ". To symbols of this form correspond couples of things whose names are respectively " x " and " y ". These things xy stand to one another in all sorts of relations, amongst others some stand in the relation R , and some not; just as I single out a particular thing by a particular name I single out all behaviours of the points x and y with respect to the relation R . I say that if an x stands in the relation R to a y the sign " xRy " is to be called true to the fact and otherwise false. This is a definition of sense. (Wittgenstein 1913, 95)

The main idea here is that the predicate ' xRy ' divides pairs of objects, "couples of things", into two groups, those pairs that bear the relation R and those that do not. This is the sense in which a predicate is like a straight line dividing a plane. The "plane" consists of all possible ordered pairs of objects. The predicate ' xRy ' divides this plane by exhaustively and exclusively dividing these pairs into two groups, those that bear the relation R and those that do not. The bipolarity of ' aRb ' is an immediate consequence of this division, since the pair $\langle a,b \rangle$ falls on one or the other side of the division determined by ' xRy '. The predicate ' xRy ' determines an exhaustive and exclusive division of pairs into those that bear R

and those that do not, and the names ' a ' and ' b ' (in that order) determine the pair $\langle a,b \rangle$. Taken together, this division and this pair present us with two possible states of affairs, one in which a bears R to b and another in which a does not bear R to b . This is the explanation of bipolarity in *Notes on Logic*.

To complete the account of sense Wittgenstein needs to explain how the proposition ' aRb ' takes the final step of saying that the pair $\langle a,b \rangle$ falls on the R side of the division instead of the non- R side. How does ' aRb ' say that a bears R to b ? The answer cannot simply be that ' aRb ' represents this positive state of affairs, since this proposition *also* represents the negative state of affairs in which a does not bear R to b . The proposition has to go beyond simply presenting these two states of affairs. It has to identify the positive state of affairs as the one whose existence it is asserting. From the perspective of *Notes on Logic*, this is the problem of the asymmetry between what a proposition represents and what it says.

The problem can also be posed in terms of truth and falsity. Wittgenstein tells us that "a proposition has two *poles*, corresponding to case of its truth and the case of its falsehood," (Wittgenstein 1913, 98-9). But how do truth and falsity come to be associated with their respective poles? Why is one pole the truth pole and the other the falsity pole? It is natural to see these questions as posterior to the question about how sense is determined. That is, it is natural to think that the assignment of truth and falsity to the poles of a proposition is fixed after, or in virtue of, the determination of a proposition's sense. But this is not how Wittgenstein conceived of the matter.

Thus a proposition has two *poles*, corresponding to the case of its truth and the case of its falsehood. We call this the *sense* of a proposition. (Wittgenstein 1913, 98-9)

Names are points, propositions arrows — they have *sense*. The sense of a proposition is determined by the two poles *true* and *false*. (Wittgenstein 1913, 101-2)

The fact that a proposition has a sense *is* the fact that it has a truth pole and a falsity pole. These are not two separate issues, one about how sense is determined and the other about how truth and falsity are assigned to the poles of a proposition. Wittgenstein makes this point very clearly in the Moore notes:

From this it results that “true” and “false” are not accidental properties of a proposition, such that, when it has meaning, we can say it is also true or false: on the contrary, to have meaning *means* to be true or false: the being true or false actually constitutes the relation of the proposition to reality, which we mean by saying that it has meaning (*Sinn*). (Wittgenstein 1914, 113)

A proposition’s having a sense is constituted by its having true-false poles. Therefore, to understand how a proposition has a sense, we need to understand how truth and falsity come to be associated with its poles.

The key remark in *Notes on Logic* comes at the end of the definition of sense: “I say that if an x stands in the relation R to a y the sign “ xRy ” is to be called true to the fact and otherwise false,” (Wittgenstein 1913, 95). In the lead-up to this remark Wittgenstein explains how ‘ xRy ’ divides ordered pairs into those that bear R and those that do not. The crucial additional point is that one of these groups is associated with truth and the other with falsity.

Not only does ‘ xRy ’ divide the “plane” of ordered pairs, it also assigns truth to one side of this division, the side containing those pairs $\langle x, y \rangle$ in which x bears R to y , and falsity to the other. Remember that the poles for ‘ aRb ’ are the possibility in which a bears R to b and the possibility in which a does not bear R to b . The first possibility is associated with truth and the second with falsity, with the result that ‘ aRb ’ has truth and falsity poles and therefore a sense.

This does not mean that the predicate ‘ xRy ’ itself has truth and falsity poles. If it did then it would have a sense and would be a complete proposition. The predicate ‘ xRy ’ determines a range of possible states of affairs as potential truth poles for propositions formed from it — all of those possible states of affairs in which two objects bear R . To determine a particular truth pole we have to fix on one of these possible states of affairs by combining two names in the form ‘ xRy ’. Wittgenstein says that ‘ xRy ’ is “true to the fact” when a fact consists of two objects bearing R . In other words, ‘ xRy ’ is *true-of* an ordered pair just in case the members of the ordered pair bear R . But being true-of an ordered pair is not the same thing as being true simpliciter. Being true-of is a relation between a predicate and an ordered pair; truth is a property of a completed proposition.

Similar remarks, more explicitly concerned with sense, appear later on in *Notes on Logic*:

But the form of a proposition symbolizes in the following way: Let us consider symbols of the form “ xRy ”; to these correspond primarily pairs of objects, of which one has the name “ x ”, the other the name “ y ”. The x ’s and y ’s stand in various relations to each other, among others the relation R holds between some, but not between others. I now determine the sense of “ xRy ” by laying down: when the facts

behave in regard to “ xRy ” so that the meaning of “ x ” stands in the relation R to the meaning of “ y ”, then I say that the [facts] are “of like sense” with the proposition “ xRy ”; otherwise, “of opposite sense”; I correlate the facts to the symbol “ xRy ” *by* thus dividing them into those of like sense and those of opposite sense. (Wittgenstein 1913, 104)

A fact is “of like sense” with ‘ aRb ’ just in case it makes this proposition true, and “of opposite sense” if it makes this proposition false. Hence, the predicate ‘ xRy ’ divides facts into two groups, and it designates one group as those that would make elementary propositions formed from it true and the other group as those that would make these propositions false.

On this account, the predicate in a proposition serves two functions. It divides pairs (or n -tuples) into two groups, and it assigns truth to one group and falsity to the other. Both of these functions are determined by conventions.

The sense of a proposition is determined by the two poles *true* and *false*. The form of a proposition is like a straight line, which divides all points of a plane into right and left. The line does this automatically, the form of a proposition only by convention. (Wittgenstein 1913, 101-2)

Conventions about ‘ xRy ’ associate this predicate with a particular division of pairs, and in addition, assign truth to one side of this division and falsity to the other. Conventions about predicates thus have two roles to play in the *Notes on Logic* theory of sense. Conventions assign predicates to relations (divisions in ordered n -tuples), and they determine the true-false poles of elementary propositions, thereby determining the senses of elementary propositions.

The “definition of sense” in *Notes on Logic* does not survive into the *Notebooks* or the *Tractatus*. There is nothing in these later works about predicates dividing objects into groups, or dividing facts into those of like sense and opposite sense. These ideas are replaced by the picture theory of meaning — the idea that a proposition has a sense by depicting a state of affairs. But this shift to the picture theory actually makes it harder to see how Wittgenstein reconciles bipolarity and sense.

4. Bipolarity in the picture theory of meaning

The first clear expression of the picture theory occurs in a remark from September 29, 1914 in the *Notebooks*. The very next day we find Wittgenstein struggling to understand how a picture can present a negative state of affairs.

A picture can present relations that do not exist! How is that possible? (Wittgenstein 1979, 8)

This is a recurring theme in the *Notebooks*:

Could we say: In “ $\sim\phi(x)$ ” “ $\phi(x)$ ” images how things are *not*? (Wittgenstein 1979, 21)

That shadow which the picture as it were casts upon the world: How am I to get an exact grasp of it?

Here is a deep mystery.

It is the mystery of negation: This is not how things are, and yet we can say *how* things are *not*. — (Wittgenstein 1979, 30)

It is easy to see how a picture presents a positive state of affairs; a picture of two men fighting depicts the state of affairs in which the men are fighting. The trouble is making sense of how a picture

also shows how things are *not*. How does a picture of two men fighting present the negative state of affairs in which they are not fighting?

Wittgenstein solved this problem when he realized that showing how things are not requires showing precisely *how* they are not, and the picture does that by depicting objects as related in the relevant way.

For the picture says, as it were: “*This is how it is not*”, and to the question “*How it is not?*” just the positive proposition is the answer. (Wittgenstein 1979, 25)

In order to show that two men are *not* fighting a picture needs to show that it is *fighting* that they are not doing, and the obvious way to do that is to show them fighting. A picture fixes upon a determinate way for things *not* to be by depicting them as related in that particular way.

The well-known example of the model in a Paris courtroom of a car accident probably helped him see this point. Suppose I have a model of a traffic intersection and I want to show you how two cars were *not* located in the intersection. How do I do that with my model? By arranging the toy cars in the model in precisely those locations where they were not. Wittgenstein puts the point as follows in the *Notebooks*:

Think of the representation of *negative* facts by means of models. E.g.: two railway trains must not stand on the rails in such-and-such a way. The proposition, the picture, the model are—in the negative sense—like a solid body restricting the freedom of movement of others; in the positive sense, like the space bounded by solid substance, in which there is room for a body.



This image is *very* clear and must lead to the solution. (Wittgenstein 1979, 30; Cf. 4.463)

This analogy between pictures and solid bodies is helpful. Just as a solid body determines two spaces at the same time, the space inside the body and the rest of space outside of it, a picture presents two states of affairs at the same time, a positive state of affairs and a negative one.

All of this is evidence from the pre-*Tractatus Notebooks* for the view that Wittgenstein retained his commitment to bipolarity after the shift to the picture theory of meaning. It is natural to wonder whether any similar evidence can be found in the *Tractatus* itself. Here we run up against the fact that there are no explicit discussions of bipolarity in the *Tractatus*. Still, there are remarks in the *Tractatus* that sound very much like expressions of bipolarity:

A picture presents a situation in logical space, the existence and non-existence of states of affairs. (2.11)

A picture depicts reality by representing a possibility of existence and non-existence of states of affairs. (2.201)

Propositions represent the existence and non-existence of states of affairs. (4.1)

Existent and non-existent states of affairs are, for Wittgenstein, positive and negative facts. “We also call the existence of states of

affairs a positive fact, and their non-existence a negative fact,” (2.06). So, he might have said instead that propositions represent positive and negative facts. These remarks, I submit, are expressions of the idea that pictures, and hence propositions, are bipolar in the deeper, representational sense.⁶

Reading bipolarity into the *Tractatus* also sheds light on Wittgenstein’s idea that “negation reverses the sense of a proposition,” (5.2341). An elementary proposition represents both a positive and a negative fact, and its sense is the positive fact. Negation “reverses” this sense by switching the sense of the negated proposition over to the negative fact. In this way, negation does not add anything to the representational content already contained in the un-negated elementary proposition.

But it is important that the signs ‘*p*’ and ‘ $\sim p$ ’ can say the same thing. For it shows that nothing in reality corresponds to the sign ‘ \sim ’.

...

The propositions ‘*p*’ and ‘ $\sim p$ ’ have opposite sense, but there corresponds to them one and the same reality. (4.0621)

One could say that negation must be related to the logical place determined by the negated proposition.

The negating proposition determines a logical place *different* from that of the negated proposition.

The negating proposition determines a logical place with the help of the logical place of the negated proposition. For it describes it as laying outside the latter’s logical place. (4.0641)

The idea that the negating proposition determines a logical place “outside” the place determined by the negated proposition is a clear allusion to the analogy between propositions and solid bodies, which shows up explicitly at 4.463.

We therefore have good but not conclusive reasons for saying that Wittgenstein’s commitment to bipolarity persisted into the *Tractatus*. On the other side, there is the problem of the asymmetry of bipolarity and sense. In contrast to the relatively straightforward account in *Notes on Logic*, it is much harder to see how Wittgenstein reconciles bipolarity and sense in the context of the picture theory.

5. The asymmetry of bipolarity and sense in the *Tractatus*

The asymmetry arises out of the fact that the sense of a proposition is only one of the two states of affairs that it represents. Recall that in *Notes on Logic* conventions played a key role in accounting for this asymmetry. The convention associated with a predicate accomplishes two tasks: it associates the predicate with a division in ordered *n*-tuples, and it assigns truth to one side of this division and falsity to the other. The first task can be thought of as an association between a predicate and a relation. This determines two poles for an elementary proposition formed from that predicate, but it doesn’t determine which pole is the truth pole and which is the falsity pole and therefore fails to fix a sense for the proposition. The second of the two tasks fills this gap.

When we shift to the picture theory this second role for conventions seems to drop out of the picture. We associate names with objects and predicates with relations—and that’s it.⁷ Once these associations have been established the propositional sign is transformed into a proposition with a sense, with no further associations or conventions required.

I call the sign with which we express a thought a propositional sign. — And a proposition is a propositional sign in its projective relation to the world. (3.12)

One name stands for one thing, another for another thing, and they are combined with one another. In this way the whole group — like a tableau vivant — presents a state of affairs. (4.0311)

Frege says that any legitimately constructed proposition must have a sense. And I say that any possible proposition is legitimately constructed, and, if it has no sense, that can only be because we have failed to give a *meaning* to some of its constituents. (5.4733)

The *only* way for a proposition to lack a sense is for one of its constituents (a name) to lack an association with an object, or for its predicate to lack an association with a relation. Once those correlations are established and the proposition is constructed there is no additional need for a convention about truth and falsity to secure a sense for the proposition. This rules out the appeal to conventions which, in *Notes on Logic*, explained the asymmetry of bipolarity and sense. How, then, does Wittgenstein account for this asymmetry in the context of the picture theory? In the rest of this paper I will consider two proposals for answering this question.

6. The arrow analogy and the bottom-up approach to the determination of sense

The first proposal is an example of what I will call a bottom-up approach to the determination of sense. On this approach, the connections between the elements of the proposition and things in the world take explanatory priority over the possession of sense by the whole proposition. The proposition '*aRb*' says that *a* bears R

to *b* because '*a*' is correlated with *a*, 'R' is correlated with the relation R, '*b*' is correlated with *b*, and '*a*' and '*b*' are positioned to the left and right of 'R'. The proposition has its sense in virtue of these correlations, and not the other way around. This is in contrast to a top-down approach, on which the having of sense by '*aRb*' takes explanatory precedence over these correlations. On a top-down approach, the correlations fall out as a consequence of the fact that '*aRb*' says that *a* bears R to *b*.

Wittgenstein's definition of sense in *Notes on Logic* is a bottom-up approach. The fact that '*aRb*' has the sense that it has is explained by conventions for the predicate '*xRy*' and the fact that '*a*' names *a* and '*b*' names *b*. The bottom-up approach is also clearly evident in the pre-*Tractatus* Notebooks. For example:

Can one negate a *picture*? No. And in this lies the difference between picture and proposition. The picture can serve as a proposition. But in that case something gets added to it which brings it about that now it *says* something. In short: I can only deny that the picture is right, but the *picture* I cannot deny.

By my correlating the components of the picture with objects, it comes to represent a situation and be right or wrong. (Wittgenstein 1979, 33-4)

Note Wittgenstein's emphasis on the word 'by' — '*dadurch*' — in the last sentence. This is a clear expression of the bottom-up approach: the picture acquires a sense *because of* the correlations between its components and objects.

Given a bottom-up approach, how could Wittgenstein account for the asymmetry of bipolarity and sense? It helps here to consider his analogy between propositions and arrows. The analogy runs from *Notes on Logic* all the way through the *Tractatus*:

A proposition is a standard to which facts behave, with names it is otherwise; it is thus bi-polarity and sense comes in; just as one arrow behaves to another arrow by being in the same sense of the opposite, so a fact behaves to a proposition. (Wittgenstein 1913, 95)

Names are points, propositions arrows—they have *sense*. (Wittgenstein 1913, 101)

Names are like points; propositions like arrows—they have sense. (3.144)

An arrow is bipolar insofar as it determines two directions at the same time, the tail-to-head direction and the head-to-tail direction. But the “sense” of the arrow is only one of these two directions, the tail-to-head direction. Here we have an asymmetry of bipolarity and sense: an arrow determines two directions, but it only points in one of those directions.

What explains the asymmetry in the case of the arrow? The answer seems obvious: the arrow has a head at only one end. We might say: *by* my putting a head at one end of the arrow, it comes to point in a direction. And as soon as it points in a direction it also determines the opposite direction. By placing a head at one end of the arrow we establish that the arrow points in a direction (sense) and that it determines two opposing directions (bipolarity).

Wittgenstein may have been thinking something similar about propositions. Suppose we start with the uninterpreted propositional sign ‘ aRb ’. By correlating ‘ a ’ with a , ‘ R ’ with the relation R , and ‘ b ’ with b we turn ‘ aRb ’ into a picture that says that a bears R to b . Establishing these correlations is the analog of fixing a head at one end of the arrow. Once the correlations are established the proposition as a whole says that a bears R to b by virtue of being a picture of that state of affairs. And since it is such a picture it also

depicts the negative state of affairs in which a does not bear R to b . By correlating the elements of the propositional sign with things in the world (objects and a relation) we endow it with both sense and bipolarity.

There is an interesting contrast between this conception of sense and the bottom-up approach to sense in *Notes on Logic*. In *Notes on Logic*, to fix the sense of a proposition we have to (i) associate its predicate with a division in n -tuples, (ii) assign truth and falsity to the sides of this division, and (iii) associate its names with objects. It is natural to think that (i) and (ii) are met in one fell swoop with a convention about the predicate. Wittgenstein suggests as much with remarks like: “I correlate the facts to the symbol “ xRy ” *by* thus dividing them into those of like sense and those of opposite sense,” (Wittgenstein 1913, 104). But this should not obscure the fact that the convention performs two distinct tasks, namely (i) and (ii). In principle, we could have a convention that only accomplishes (i), in which case we would have a proposition that is bipolar but does not have a sense. The theory of sense in *Notes on Logic* therefore allows for the possibility of propositions that are bipolar but lack sense. This is not the case on the present bottom-up understanding of the picture theory in the *Tractatus*. On this reading of the picture theory we create a proposition, a picture with a sense, by associating its names with objects and its predicate with a relation. Once the propositional sign is a picture that says that things are thus-and-so it also depicts a negative state of affairs in which things are not thus-and-so. This makes the bipolarity of the proposition a *consequence* of its having the sense that it has, which rules out the possibility of bipolar propositions that lack sense.

The analogy with arrows is helpful, but it also raises many questions of its own. For example, on Wittgenstein's early view, is it a conventional or subjective fact about the arrow that it points in the tail-to-head direction, or is this an intrinsic or objective feature of the arrow that does not depend on any contribution from us? A clue about this comes from a remark about arrows in the *Philosophical Investigations*:

"Everything is already in there" How does it come about that this arrow \rightarrow *points*? Doesn't it seem to carry in it something besides itself? — "No, not the dead line on paper; only the psychical thing, the meaning, can do that." — That is both true and false. The arrow points only in the application that a living being makes of it.

This pointing is *not* a hocus-pocus which can be performed only by the soul. (Wittgenstein 1958, §454)

The target here is the idea that the arrow's pointing in a direction depends essentially on a mental act of meaning applied to the arrow. The arrow points in the tail-to-head direction because that is how we mean it to point, where this act of meaning is something we do with our minds. That may have been how Wittgenstein thought of it at the time of the *Tractatus*. If so, then just putting the head at one end of the arrow would not be enough to make the arrow point in a direction, since we would also need to perform a mental act of meaning. Returning to propositions, the thought would be that just correlating names with objects and a predicate with a relation is not enough.⁸ In addition, we need to *mean* the whole proposition in a certain way, e.g. as saying that *a* bears R to *b*. But this thought — that the proposition does not have a sense until we perform a mental act of meaning applied to the whole

proposition — takes us a large step away from the bottom-up approach and in the direction of a top-down approach.

7. The context principle and the top-down approach to the determination of sense

The top-down approach reverses the explanatory order of the bottom-up approach. We endow a propositional sign with sense by interpreting the whole sign as asserting the existence of a state of affairs, e.g. we interpret '*aRb*' as saying that *a* bears R to *b*. Given that the proposition has this sense, it must be that '*a*' names *a*, 'R' is correlated with R, and '*b*' names *b*. On the top-down approach, the correlations attaching to the components of the proposition are explanatorily posterior to the possession of sense by the whole proposition.

The main source of support for the top-down approach comes, of course, from the context principle:

Only propositions have sense; only in the nexus of a proposition does a name have a meaning. (3.3)

If a name has a meaning *because* it occurs in a proposition with a sense, as on the top-down approach, then it is clear why a name can *only* have a meaning in the context of a proposition. On the other hand, on the bottom-up approach, the correlation between a name and object is prior to, and in that sense independent of, the having of sense by the whole proposition. The bottom-up approach looks like it is in conflict with Wittgenstein's commitment to the context principle.

There is reason for thinking that the context principle took on increased significance in the final version of the *Tractatus*. As Mi-

chael Kremer (1997) has noted, Wittgenstein moved the context principle up in his numbering system between the *Prototractatus* and the *Tractatus*. In the *Prototractatus*, the context principle occurs at 3.202; in the *Tractatus* it occurs at 3.3. This is evidence for thinking that the context principle took on a more central role in the *Tractatus*, and thus evidence in favor of a top-down reading.

Now, on the top-down view, there is no reason why we could not interpret a propositional sign as asserting the *non*-existence of a state of affairs. For example, we could take '*aRb*' to say that *a* does not bear R to *b*. This would be to endow the proposition with a negative fact as its sense. And in fact, Wittgenstein recognized the possibility of having an elementary proposition assert the existence of a negative fact:

For a proposition is true if we use it to say that things stand in a certain way, and they do; and if by '*p*' we mean $\sim p$ and things stand as we mean that they do, then, construed in the new way, '*p*' is true and not false. (4.062)

But it is important that the signs '*p*' and ' $\sim p$ ' can say the same thing. For it shows that nothing in reality corresponds to the sign ' \sim '. (4.0621)

These remarks imply that '*aRb*' could have said that *a* does not bear R to *b*. This is exactly what we should expect on a top-down approach to sense. On the top-down view we endow an uninterpreted propositional sign with a sense by taking it to say that objects are related in a certain way or by taking it to say that they are not related in a certain way. The resulting language-world correlations will be the same on either way of endowing the sign with a sense. Anscombe emphasizes this point:

Now, confining ourselves to pictures, it is also clear that if we 'think the sense of the picture' by correlating its elements with actual objects, we can in fact think it in either of *two* ways: namely either as depicting what is the case, or as depicting what isn't the case. That is to say, there are two senses which we can 'think' in connection with the picture. ... And the difference between the two is not that the relations between the elements are taken to be different; on the contrary, they are exactly the same. (Anscombe 1959, 69)⁹

Consider a picture with two stick figures engaged in a sword-fight. We could take this to say that two men were sword-fighting, or that they were *not* sword-fighting. On either way of interpreting the picture it will follow that one of the stick figures stands for one of the men, the other stick figure for the other man, and the relation between the stick-figures stands for sword-fighting.

How does this account for the asymmetry of bipolarity and sense? As on the bottom-up version of the picture theory, it does so by putting sense before bipolarity. An elementary propositional sign acquires a sense when we interpret it to assert the existence (or non-existence) of a state of affairs. This is to transform the propositional sign into a picture of a positive (or negative) fact. Once it is such a picture, it also depicts the corresponding negative (positive) fact. By endowing the propositional sign with sense we turn it into a picture that depicts both a way for things to be and a way for them not to be.

8. Conclusion

Which of these two ways of thinking about the sense of elementary propositions, the bottom-up or the top-down, did Wittgenstein accept in the *Tractatus*?¹⁰ Both views can explain the asymme-

try of bipolarity and sense, so they are even in that respect. I don't think the texts decide this definitively, but let me make a final speculative remark. As we have seen, the definition of sense in *Notes on Logic* is a bottom-up approach and there are clear expressions of the bottom-up approach in the *Notebooks*, none of which survive into the *Tractatus*. In addition, the importance of the context principle increases in the transition from the *Prototractatus* to the *Tractatus*. My final speculative remark, then, is that he held a bottom-up view from *Notes on Logic* through the composition of the *Notebooks*, his view was in transition as he compiled the *Prototractatus*, and that he took a decisive turn in favor of the top-down view in the final composition of the *Tractatus*.¹¹

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Notes

¹ Following Pears and McGuinness (Wittgenstein 1961) I am going to use 'present' and 'represent' interchangeably as translations of Wittgenstein's uses of 'vorstellt' and 'darstellt'. Following (Friedlander 1992), Ostrow (2002) sees a distinction in Wittgenstein's uses of 'vorstellt' and 'darstellt', and uses 'present' for the former and 'represent' for the latter. Using Ostrow's terminology, the asymmetry I am interested in is that a proposition *presents* both positive and negative states of affairs, but it only *represents* one of these states of affairs. See (Ostrow 2002, 80-81).

² See also (Carruthers 1989, 30) and (Proops 2000, 2).

³ I am suggesting that the term 'bipolarity', as Wittgenstein used it, should not be understood to mean the dual capacity for truth and capacity for falsity, which is the dominant understanding among commentators. Bipolarity is better understood to mean the property of representing both positive and negative states of affairs. But I don't want this to be a terminological debate between commentators about how to use the term 'bipolarity'. Those wedded to the more common interpretation can take my suggestion to be about a widely overlooked ground or basis for bipolarity. Thanks to an anonymous referee for discussion of these points.

⁴ On this conception of propositions as facts, the predicate in a proposition functions, not as a name for a relation, but as the way in which names are related in a fact. Following Ricketts (1996), we could say that in the proposition '*aRb*', the name '*a*' R-leftflanks the name '*b*', and '*b*' R-rightflanks '*a*'. This is to view the predicate as a relation that binds names together into a fact (3.1432). The predicate is the way in which names are concatenated in an elementary proposition (4.22). For example, in the elementary propo-

sitions 'a**S**b' and 'a**T**b' the names 'a' and 'b' are concatenated in different ways. These different forms of concatenation are the predicates 'x**S**y' and 'x**T**y'.

⁵ This is, of course, not how he uses the term 'form' in the *Tractatus*. The *Notes on Logic* concept of form is replaced in the *Tractatus* with the concept of the structure of a proposition. See 2.032-2.043.

⁶ It has been suggested to me, by Michael Kremer and an anonymous referee, that these remarks are better read as expressions of the idea that propositions are truth-functions of elementary propositions. I don't think this is right. The similarities between 2.11, 2.201, and 4.1 make it clear that 4.1 is an extension to propositions of a point he makes about pictures, and Wittgenstein never says that pictures are truth-functions of elementary pictures. Furthermore, the claim that "a proposition is a truth-function of elementary propositions" shows up explicitly at remark 5, which marks a clean break with the 4's and the beginning of a new section of the *Tractatus*. 2.11 and 4.1 are direct comments on basic remarks that introduce pictures and propositions as representations, "We picture facts to ourselves" (2.1) and "A thought is a proposition with a sense" (4), respectively. Remarks 2.11 and 4.1 should therefore be read as elaborations on the way in which pictures and propositions are representational, and not on the way in which propositions are built up out of elementary propositions.

⁷ Wittgenstein rarely mentions the need to correlate a predicate with a relation—most of the time he only mentions the correlations between names and objects—but it must have been his view that there are such correlations for predicates. For example, at 3.21 he says that "the configuration of objects in a situation corresponds to the configuration of simple signs in the propositional sign," and by "the configuration of simple signs in the propositional sign" he means a predicate. In other words, the ways in

which names are related in propositions (predicates) correspond to the ways in which objects are related in states of affairs. The source of this correspondence must be located in us. Predicates, the ways in which names are configured in propositions, are arbitrary linguistic forms. We have to establish the correlations between these linguistic forms and worldly relations.

⁸ It is almost irresistible to say that these correlations are themselves the results of mental acts, e.g. a mental act of associating the name 'a' with *a*. This is, of course, another central target of Wittgenstein's later work.

⁹ Even though this remark of Anscombe's illustrates a feature of the top-down approach, i.e. the sameness of pictorial correlations across two ways of interpreting a proposition, it is not clear that Anscombe was putting forward a top-down reading. For example, she says that "we 'think the sense of the picture' by correlating its elements with actual objects," which suggests a bottom-up approach. And immediately preceding this she says "it is we who 'use the sensibly perceptible signs as a projection of a possible state of affairs'; we do this by using the elements of the proposition to stand for the objects whose possible configuration we are reproducing in the arrangement of the elements of the proposition," (Anscombe 1959, 69). Again, this sounds like a bottom-up approach to sense.

¹⁰ William Child (2011) draws essentially the same bottom-up/top-down distinction, and argues in favor of the top-down approach. See (Child 2011, 32-5).

¹¹ Thanks to audiences at the SSHAP meeting at McMaster University in May 2012 and the University of Minnesota in October 2012. I am especially grateful to Michael Kremer, Kirk Ludwig, Chris Pincock, and Victor Rodych for comments and advice.

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