Chapter 4
Truth

Abstract This chapter explores another component of the traditional account of knowledge in detail. Although it is often taken as clear, the nature of truth is a complex philosophical issue and worth careful consideration. This chapter examines both traditional and contemporary theories of truth as well as realist and anti-realist conceptions of truth. Further, it briefly looks at some of the major challenges for a successful theory of truth. Ultimately, this chapter puts forward an argument for a commonsensical, realist conception of truth. This conception of truth is supported by both philosophical argument as well as recognition of its presupposition in science. While neither of these considerations is decisive, together they do provide a strong case for accepting this realist conception of truth. At the very least these considerations make it is clear that working with this realist conception of truth to further understand the traditional account of knowledge is perfectly acceptable.

The second component of the traditional account of knowledge is *truth*. We have noted that it is possible to know that p only when p is true. But, what does it mean for p to be true? In some sense we already have a good grasp on at least a partial answer to this question—p is true when it accurately describes the way the world is. As Aristotle (1941, *Metaphysics*, 1011b25) famously said:

> To say of what is that it is not, or of what is not that it is, is false, while to say of what is that it is, and of what is not that it is not, is true.

Not only do we have this basic grasp of what it means to be true, we can easily list a large number of truths: "$1 + 1 = 2$", "all dogs are animals", "circles are not squares", "George Washington was the first president of the United States", "sugar typically dissolves in water", and so on. Nonetheless, it seems that there is more to understanding truth than simply being able to report various truths. Knowing things that are true does not amount to knowing what *truth* is. It seems clear that we might know that various propositions are true without knowing the nature of truth, i.e. without knowing what it is that all true propositions have in common. So, the question we are presented with, which will be the focus of this chapter, is: What is the nature of truth?

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4.1 Preliminaries

Before considering various answers to the question as to the nature of truth it will be useful to make a few preliminary points. First, it is worth emphasizing that a satisfactory answer to our question will not simply amount to a listing of examples of true propositions. Our question concerns the nature of truth itself, not simply knowledge of the truths in some particular domain of inquiry. For example, listing all of the known truths of science will not itself provide an explanation of the nature of truth. Instead, a satisfactory answer to our question—what is the nature of truth?—will explain what it is that all true claims share and all false claims lack (Wrenn 2014). Exploration of various candidates for this sort of answer will be our primary focus in this chapter.

A second preliminary point worth making is that there is a live debate about what constitutes the primary bearers of truth. *Truth bearers* are simply the sorts of things that can be true or false. A rock is not a truth bearer, but a proposition is. Although there are perhaps many candidates for truth bearers, only two are serious contenders for being the *primary* truth bearers (Burgess and Burgess 2011; Wrenn 2014). All other truth bearers are truth bearers only insofar as they are related to the primary truth bearers in a particular way. For example, the two leading contenders for primary truth bearers are propositions and sentences. One might hold that an utterance, such as "All dogs are animals", is true because it expresses a true proposition or because it expresses a true sentence. In this way utterances can be truth bearers, but they are not primary truth bearers.

In order to better understand the debate concerning primary truth bearers, recall the distinction between propositions and sentences from chapter two. As we noted in that chapter, propositions are what our declarative sentences mean, but they are not identical to those declarative sentences. The English sentence "The ball is red", the Spanish sentence "La pelota es de color rojo", and the German sentence "Der Ball ist rot" are all very different sentences. Yet, each of these sentences means the same thing because they all express the same proposition. Most philosophers hold that it is propositions, which are true or false, and sentences are only true or false insofar as they express true or false propositions.[1] Although the debate about which truth bearers are primary is interesting, it is quite intricate, and it is not central to our discussion in this chapter or our subsequent discussions. So, rather than trying to settle this issue we will simply go with the majority of philosophers and assume that propositions are the primary truth bearers.[2]

The final preliminary is a very important distinction. For the most part this distinction will not affect our discussion of theories of the nature of truth. Nevertheless, the distinction is still very important to make because it is relevant to our later

[1]Two notable exceptions are Field (2001) and Quine (1992). Both Field and Quine argue that sentences, rather than propositions, are the primary bearers of truth.

[2]See Soames (1999) for an example of the sorts of reasons that lead the majority of philosophers to claim that propositions rather than sentences are the primary bearers of truth.

discussions of knowledge in general and scientific knowledge in particular. This is the distinction between *necessary* and *contingent* truths. Necessary truths are truths that could not have been false. That is, the denial of a necessary truth describes an impossible situation. For example, <squares have four sides> is a necessary truth. It is impossible for there to be a square that has more or less than four sides. Similarly, <bachelors are married males> is a necessary falsehood—there is no possible situation in which this proposition is true. Although there are many (an infinite number in fact) necessary truths, it is contingent truths that we are most interested in when conducting science. Contingent truths are propositions that in fact are true, but which could have been false. For example, it is true that there is life on Earth, but it could have been that life never arose on this planet. Hence, <there is life on Earth> is true, but only contingently so. It is true that objects near the surface of the Earth fall at a rate of approximately 9.8 m/s^2. However, this truth, like other laws of nature, is contingent. It is possible that in a different world gravitation would have behaved differently than it does in our world.[3] The same holds for other laws of nature.[4] This is not to say that laws of nature do not hold universally in this world or that they are apt to change as time progresses. Rather, the point is simply that laws of nature are contingent truths, not necessary truths.

4.2 Truth and Objectivity

Now that we have cleared up some preliminaries it is time to explore the philosophical debate about the nature of truth. There are three categories of views on the nature of truth: realism, relativism, and anti-realism.[5] One can understand the debate between these three kinds of theories of the nature of truth as hinging on the answers to a pair of questions. As Chase Wrenn (2014, p. 25) explains "First, is anything true irrespective of what anyone believes? If so, then relativism is incorrect. Second, is there anything that is true even though there is no way, in principle, for anyone to know that it is? If so, then anti-realism is incorrect." Roughly, relativism claims that truth depends upon what people believe, anti-realism claims that truth

[3]Recall, as we noted in the previous chapter, "world" refers to the entire universe.

[4]This is something widely accepted by philosophers of science, but like many things in life it is not universally so. Some philosophers hold that laws of nature are necessary truths. For example, see Bird (2007), Fales (1990), and Shoemaker (1998). Fortunately, we do not need to enter into the debate concerning the necessity of natural laws for our purposes.

[5]It is a bit unfortunate that two of the categories are called "realism" and "anti-realism" because there are several debates in philosophy in which various views are labeled "realism" or "anti-realism". As we will see in chapter fourteen a major debate in philosophy of science occurs between realists and anti-realists. Realism and anti-realism in the debate in philosophy of science are different positions than realism and anti-realism about truth. Given that the names "realism" and "anti-realism" are well entrenched in both debates, we will simply follow the literature and stick with these terms. The context of the discussion will make it clear whether realism/anti-realism about truth or realism/anti-realism about science is intended.

depends upon what people can come to know, and realism denies both of these claims. Let us take a closer look at each of these kinds of theories of the nature of truth beginning with realism.

4.2.1 Realism

Realism captures our commonsense view of the nature of truth. It is the view that the world is the way that it is independently of what we think. On a realist view truth is objective and independent of what we can or cannot know. This picture of the nature of truth emerges from consideration of two facts about our experiences (Wrenn 2014). First, there are times when we mistakenly believe things that are not true. In the very distant past many people believed the Earth was flat. They were wrong. You have likely believed something that turned out false. Perhaps you believed (or even currently believe) that Humphrey Bogart's character in *Casablanca* says, "Play it again, Sam". After all, this is one of the more widely misquoted lines in cinema—Bogart does not say, "Play it again, Sam" in the movie though. If you believed that he did, you were mistaken. Unfortunately, we can easily think up numerous further examples like these. It is a fact that we sometimes mistakenly believe false things. Second, we sometimes discover previously unknown truths. For example, when Alexander Fleming made his Nobel Prize winning discovery of penicillin he uncovered a previously unknown truth—this particular antibiotic exists. It is quite possible that you will someday discover a hitherto unknown truth. There are many such truths out there waiting to be discovered.

These facts about our common experiences seem to clearly indicate how we should answer Wrenn's two questions. First, there are truths that exist independently of our beliefs. Denying this would commit us to thinking that when most people thought that the Earth was flat it really was! Note, this is not to say that they meant something different by "flat" than we do; it is to say that since they believed the Earth was flat, it was. Obviously, this is wrong. The mere fact that we believe something does not make it so. Even if everyone on the planet convinces herself or himself to believe that the Earth is flat, that will not change the shape of our planet one bit. It will remain roughly spherical, not flat. Second, there are things that are true whether or not we can ever know that they are. Right now there either is or is not an enormous teddy bear floating ten trillion light years away from our galaxy. This is a fact that we will never be in a position to confirm or disconfirm—we simply will not be able to check to see whether the teddy bear is there or not. Nonetheless, it seems clear that there is a truth of the matter here. If there is no teddy bear there, then it is true that there is not a teddy bear floating ten trillion light years from our galaxy. If there is one, then it is false that there is not a teddy bear floating ten trillion light years from our galaxy. As we noted above, realism claims that truth exists independently

of what we know and believe. Realism is correct. The world around us is mind independent.[6]

Although realism seems to be our commonsense view of the nature of truth, its insistence on a mind-independent world does open the way for a particular challenge: skepticism. Since realism holds that the world is independent of what we can know and what we do believe, one might think that we will never be in a position to have objective knowledge about the world. After all, our only contact with the world comes to us from our experiences and perhaps our intuitions. Given realism, how we take the world to be on the basis of our experiences *could be* very different from how the world actually is. It is just this point that the skeptic claims leads to our lacking knowledge of truths about the world around us. Roughly, since our experiences could be misleading, skeptics claim that we cannot know that the world is the way that those experiences make it seem to be. Although this is a significant challenge, it is one that philosophers have been considering and working out replies to for a long time. Furthermore, it is one that we will see (in chapter eleven) that it is reasonable to think can be overcome. For now we will set aside exactly how the skeptical challenge can be met.

Given its strong grounding in facts about our experiences and its fit with commonsense, realism is the default view when it comes to the nature of truth. This is as it should be. In order for us to abandon a realist picture, whichever one we ultimately settle on, we would need strong reasons to prefer a relativist or anti-realist picture instead. As we will see, such reasons are not likely to be had.

4.2.2 Relativism

The first rival to realist views of the nature of truth is relativism. Relativism denies the realist's claim that the world is a certain way regardless of what we can know or do believe about it. According to relativism, there is no way the world is objectively. In other words, truth is relative to what people believe. So, it is possible that one and the same proposition can be true for me, and yet, false for you. Of course, there are cases where it is clear that there is no objective fact of the matter. For example, you might like chocolate ice cream best while I like cookies & cream ice cream best. What is the truth concerning the best ice cream? Clearly, this is merely a matter of opinion. Chocolate ice cream is best for you and cookies & cream is best for me.

[6]It is worth noting that these claims hold even if one accepts a Kuhnian view of scientific change. When a paradigm shift occurs things that were once true do not suddenly become false. Likewise, things that were false do not suddenly become true. Instead, the scientific community adopts a new framework from which to organize the truths that we have come to know and to determine how best to uncover new truths. At most, things that were once *thought* to be true or false are no longer accepted or rejected under the new paradigm. The truth itself does not change. For more on the Kuhnian view of scientific change see Kuhn (1962).

Similarly, you might think that a particular joke is funny while I think that it is not funny. What is the truth concerning the joke: is it true that it is funny? Again, this seems to be just a matter of opinion. <The joke is funny> is not simply true or false. It is true or false relative to particular people. It is true for you, but not for me.[7] Relativism is the view that all propositions are like <the joke is funny> in the sense that they are only true or false relative to people. Consequently, even things like $<1 + 1 = 2>$ and <Earth is not flat> are only true relative to certain people.

There are two main kinds of relativism: subjectivism and what we will call "group relativism". Subjectivism is the view that truth is relative to individual people. So, what is true and what is false depends on what the individual person believes and disbelieves. According to subjectivism, if James believes that $1 + 1 = 3$ and disbelieves that the sun is more massive than Earth, then $<1 + 1 = 3>$ is true for him and <the sun is more massive than Earth> is false for him. If James has no opinion about whether the Earth is flat, then subjectivism holds that <Earth is flat> has no truth-value for James—it is neither true nor false.

Group relativism differs from subjectivism because it does not claim truth is relative to individuals. Instead, group relativism holds that truth is relative to groups. Hence, if the relevant group is one's nation, then what is true will depend on what the majority of people who belong to that nation believe. An example will help illustrate group relativism and how it differs from subjectivism:

> Uma is a citizen of the United States. The majority of citizens in the United States believe that Earth is not flat. Uma does not herself accept this; she believes that Earth is flat.

On group relativism, since the majority of people in the United States believe that Earth is not flat, it is true for Uma that Earth is not flat. This is so regardless of the fact that Uma disbelieves this. It is easy to see how subjectivism and group relativism can come apart in this case. Group relativism claims that <Earth is not flat> is true for Uma, but subjectivism claims that <Earth is flat> is true for Uma because she believes it to be so.

Both versions of relativism are plagued by serious difficulties. It will be instructive to consider some of the major problems with these kinds of theories. First of all, subjectivism entails that we are never mistaken about anything. If you believe that p, then p is true for you. It does not matter what proposition we are discussing! If you believe that pigs fly, then <pigs fly> is true for you. If you later change your mind about this, then you are still correct because now <pigs fly> is false. Clearly, this is not right. If we can be sure of anything about the nature of truth, it is that sometimes we mistakenly think that false propositions are true, and sometimes we mistakenly think that true propositions are false.

Now, one might think that group relativism avoids this problem because it does not make truth relative to whatever individual people believe. It faces a very similar problem of its own though—groups can never be wrong. If the relevant group is

[7] The joke example is borrowed from Wrenn (2014).

one's nation, then whatever the majority of people in the nation believe is true for everyone in that nation. This is obviously false. If it were the case that the majority of people in the United States were to believe that the moon is made of cheese, group relativism would say that it is true that the moon is made of cheese for everyone who is a citizen of the United States. This is ridiculous.

Notice how when speaking of group relativism the claims were always qualified by "if X is the relevant group". This suggests a second problem for group relativism—determining the relevant group. Each of us belongs to many groups. For example, Uma is a citizen of the United States, but she is also a member of the human race. What are we to say when the majority of people in the United States believe that *p*, but the majority of humans believe that *not p*? What is true concerning *p* for Uma? Is *p* both true and not true for her at the same time, or does one group take precedence? It does not seem that group relativism has the tools needed to answer these questions. This appears to be a very serious problem for this sort of view because without a way of determining which group is the relevant group, group relativism cannot tell us what truth is.

A final problem for both relativist views can be traced back to Plato's *Theaetetus*. In that dialogue Plato argues that relativism about truth is self-defeating. Here is a version of Plato's argument applied to relativism in general, and so, applicable to both subjectivism and group relativism:

1. Assume (for the sake of argument) that relativism is true.
2. Either relativism is only true relative to those who believe it (either individuals or groups) or it is true regardless of what anyone believes about it.
3. If relativism is true regardless of what anyone believes about it, then relativism is false (because relativism claims that all truths are relative, but the truth about relativism would not itself be relative).
4. If relativism is only true relative to those who believe it, then it is false for those who disbelieve it (such as realists and anti-realists).
5. Therefore, either relativism is false simpliciter, or it is false for anyone who denies relativism.

This argument is sometimes referred to as the "peritrope" because it is a turning of the table. That is, it turns relativism against itself.[8] This argument provides reason for thinking that relativism, whether it is of the subjectivist or group variety, is a self-defeating view of the nature of truth.

In light of these objections to both subjectivism and group relativism, it is reasonable to think that neither variety of relativism provides a sufficiently plausible alternative to warrant abandoning the realist view of the nature of truth.

[8]For further contemporary discussion of this argument see Swoyer (2014) and Wrenn (2014).

4.2.3 Anti-realism

The second rival to realist theories of truth is anti-realism. Anti-realism differs from relativism in that it does not hold that truth depends on what people believe nor that truth is relative to individuals or groups. However, anti-realism also differs from realism because it denies that the world is mind independent. Instead, anti-realism is the view that truth is closely tied to what it is possible for us to know. According to anti-realism, the only things that are true or false are those that we could come to know are true or false. Thus, if there is no way for us to ever know whether *p* is true or not, anti-realism says that *p* has no truth-value at all—it is neither true nor false. For example, there is no way we can come to know whether there is an enormous teddy bear floating ten trillion light years away from our galaxy. Ten trillion light years is simply too far for us to ever observe; it is outside of our observable universe. In light of this, anti-realism commits one to claiming <there is an enormous teddy bear floating ten trillion light years away from our galaxy> is neither true nor false.

Two of the more prominent versions of anti-realism are the coherence theory of truth and the pragmatic theory of truth. The coherence theory of truth is the view that when *p* is true it is part of a coherent, and sufficiently comprehensive, set of beliefs.[9] The pragmatic theory of truth as first developed by C.S. Peirce (1878/1982) holds that *p* is true when we *would* believe that *p* without doubt after an ideal investigation (an investigation where we have examined everything to the point that there is nothing more for us to learn on the topic). A somewhat different version, developed by William James (1907/2000), holds that *p* is true when believing it is useful to us. That is to say, *p* is true when we succeed at our endeavors by acting on the basis of accepting *p*.[10] Although both coherence and pragmatic theories of truth are interesting and face serious problems unique to their own idiosyncrasies, we will not examine them individually.[11] The reason for this is that as anti-realist views of truth both coherence and pragmatic theories share two very formidable problems that result from the general anti-realist picture. Examining these two problems is sufficient for recognizing that such views fail to provide a superior alternative to realism.

The first problem faced by anti-realist views is that they are inconsistent with a basic truth of classical logic (Wrenn, 2014). Consider the following proposition: <there is a teddy bear floating ten trillion light years from our galaxy or there is not a teddy bear floating ten trillion light years from our galaxy>. This proposition is of the form <*p* or not *p*>, and so it is something that everyone, even anti-realists, grant that we know to be true. Of course, any proposition that is constructed by combining two other propositions with "or" such as <*p* or not *p*> or <*p* or *q*> is true provided

[9]For various versions of the coherence theory of truth see Bradley (1914), Putnam (1981), and Young (1995).

[10]For more on the pragmatic theory of truth see Hookway (2013) and Misak (2007).

[11]For objections to the coherentist theory of truth see Russell (1907), Thagard (2007), and Walker (1989). For objections to both the coherentist theory of truth and the pragmatic theory of truth see Russell (1912/2001) and Wrenn (2014).

that at least one of the propositions connected with "or" is true. However, given anti-realism <there is a teddy bear floating ten trillion light years from our galaxy> is neither true nor false because we cannot know whether it is true. Similarly, <there is not a teddy bear floating ten trillion light years from our galaxy> is neither true nor false for the same reason according to anti-realism. This commits the anti-realist to claiming that propositions of the form <*p* or *q*> can be true even though neither *p* nor *q* is true. This is inconsistent with basic truths of classical logic. Thus, to accept anti-realism is to deny basic logical truths.

The second problem for anti-realism comes from the "Knowability Paradox".[12] The thrust of the problem the Knowability Paradox raises for anti-realism is that it shows anti-realism not only commits one to claiming that all truths are *knowable*, but it commits one to claiming that in fact, every truth is *known* by someone. To illustrate this let us assume there is a truth that no one knows (let us call this unknown truth "*p*"). So, *p* is true and not known to be true by anyone. This means that <*p* is true and not known> is true. According to anti-realism, since <*p* is true and not known> is true, <*p* is true and not known> is knowable. In other words, anti-realism is committed to it being possible for someone to both know that *p* is true *and* to know that *p* is not known. But, it follows from this that it is possible someone knows that *p* is true, and at the same time she knows that no one knows that *p* is true.[13] Of course, if someone knows that no one knows that *p* is true, then no one knows that *p* is true. After all, we saw in chapter two that knowledge entails truth—if S knows that *p*, then *p* is true. Thus, anti-realism entails that it is possible that at the same time someone knows that *p* is true and no one knows that *p* is true! This is a clear contradiction, so something must be wrong. But, what could it be?

The only assumptions made in the above argument are: (1) a very plausible principle (single premise closure), (2) the claim that knowledge entails truth, (3) there are truths that are not known, and (4) anti-realism about truth. At least one of these must be abandoned in order to avoid the above contradiction. (1) and (2) are both exceedingly plausible, so they should not be given up. The best bet for the anti-realist is to deny (3). Yet, this commits the anti-realist to claiming not only that all truths are knowable, but also that all truths are in fact known. This is a highly implausible claim. Of course, the most viable option when faced with this argument seems to be to give up (4)—deny anti-realism about truth.[14] Again, it appears that realism is superior to its anti-realist rival.

We have seen that there are strong reasons for thinking that among the three primary approaches to the nature of truth, realism is the best. Unsurprisingly, the debate does not end here. There are numerous forms that realism can take. It is

[12]For more in-depth discussion of this paradox see Fitch (1963), Kvanvig (2006), and Salerno (2009).

[13]This follows by an exceedingly plausible principle known as "single premise closure". Roughly, single premise closure is the idea that when someone knows that <*p* and *q*>, then that person knows that *p* and she knows that *q*. For more on single premise closure see Hawthorne (2004).

[14]For further discussion see Wrenn (2014).

because of this that the primary rivalries in the contemporary debates about truth are between supporters of opposing realist theories of truth. Fortunately, we do not need to adjudicate between these various versions of realism.[15] Instead, our purposes will be served by recognizing that a broadly realist approach is the best way to understand the nature of truth. However, before moving on to a final issue related to truth we will first briefly explore an approach to the nature of truth that attempts to cross the divides between each of the three approaches we have considered thus far.

4.3 Pluralist Theories of Truth

Although we have seen that realism is plausibly superior to its major rivals (relativism and anti-realism), recently some have argued that there is an even better approach to the nature of truth. These pluralist theories hold that there is not a single property that is had by all truths. Instead, pluralism holds that truth in different domains is yielded by different properties.

In general, pluralism is motivated by the claim that it avoids purported problems for various versions of the other approaches to truth. The primary problem that pluralism is constructed to avoid is the "scope problem" (Wrenn 2014). In order to appreciate this purported problem consider the following claims:

(a) The sun is more massive than Earth.
(b) The cars missed one another, but they could have collided.
(c) Ted's joke is funnier than Tom's joke.
(d) Causing needless suffering is wrong.

Essentially, the challenge of the scope problem is to account for the shared property that makes all of (a–d) true. Theories of truth are thought to have a scope problem when they work well in explaining the relevant property in some cases, but not others. Pluralists maintain that various forms of realism are well suited

[15]The three primary versions of realism on offer are correspondence theories, truth-maker theories, and deflationism. Roughly, they have the following to say about the nature of truth. Correspondence theories claim that truth consists of a proposition's "fitting" with reality. This is often put in terms of *p*'s corresponding to a particular fact about the world or to a particular state of affairs. The central idea behind truthmaker theories, which are sometimes considered to be a kind of correspondence theory, is that for any truth there is a truthmaker—something in the world that makes it true. Finally, deflationism is inspired by developments in modern logic. Deflationism is the view that all there is to understanding truth is to understand the logic and grammar associated with the predicate "is true". Of course, there is much more to be said about each of these varieties of realism. Nonetheless, as noted in the main text, for our purposes we do not need to go into the gritty details. For more on all three of these versions of realism see Burgess and Burgess (2011) and Wrenn (2014). For more on correspondence theories see Alston (1996), David (2009), Fumerton (2002), and Wittgenstein (1922/1990). For more on truthmaker theories see Armstrong (2004), Beebee and Dodd (2005), and Rodriguez-Pereyra (2006). For more on deflationism see Field (2001), Horwich (1998), Quine (1992), and Ramsey and Moore (1927).

to handle claims like (a), but not, say, (c). Similarly, various rivals to realism are well suited to account for claims like (c), but not those like (a). Pluralism has been proposed because it is thought that the best explanation as to why some truths are better explained by the various theories of truth than others is simply that there are different properties that make those disparate truths true.

There are two primary ways of cashing out the general commitments of pluralism. The first, *simple pluralism*, is just the view that there is not a single nature of truth.[16] Instead, according to simple pluralism, the nature of truth is different for various subject matters. A few philosophers have suggested this view, but most prominently it has been developed by Crispin Wright (1992, 2001).[17] Although Wright's view is interesting and worth serious consideration, we will not explore its finer points and the particular objections that it faces.[18] The reason for this is quite simple. While Wright does advocate pluralism about the nature of truth, he claims that when it comes to truths in science the nature of those truths is as realism describes. Since our primary focus is scientific knowledge, it is sufficient for our purposes that Wright accepts realism (or at least a particular version of it) when it comes to truths in science.

The second primary form of pluralism about truth is Michael Lynch's (2004, 2009) *alethic functionalism*. Lynch holds that truths in various discourses do not need to be true in the same way. However, he maintains that even though there are different ways of being true, the properties that make various claims true are all ways of manifesting a single property—the property of being true. An analogy will help make alethic functionalism clearer. Consider a famous role, the role of Santa Claus, say. Many actors can play, and have played, Santa Claus in many different film and theatre productions. Additionally, many people have dressed up as Santa Claus around the holidays. Although it is different people dressing up as Santa Claus in these cases, they are all dressing up as the same character—they are all playing a single role. Similarly, truth, according to alethic functionalism, is a role that can be played by various properties in different discourses.[19] Again, while alethic functionalism is an interesting theory of the nature of truth that warrants serious consideration, we do not need to explore it in detail. The reason for this is that Lynch, like Wright, maintains that truths in science are manifested by the sort of property that realists claim. So, even if pluralism about truth is correct as a general theory of the nature of truth, it seems that pluralists agree that truths in the domain of science are best understood in the way that realists understand all truths. Thus, for our purpose of understanding knowledge as it pertains to science it is safe to adopt a broadly realist conception of the nature of truth.

[16]This discussion follows Wrenn (2014) in referring to this view as "simple pluralism".

[17]Quine (1981) suggests that something like this view might be correct even though he primarily defends a deflationist view of truth.

[18]For more detailed critical discussion of Wright's view see Pedersen and Wright (2013) and Wrenn (2014).

[19]See Wrenn (2014) for further analogies that help explicate alethic functionalism.

4.4 Verisimilitude

At this point we have seen that the most promising way to understand truth, particularly as it pertains to science, is in broadly realist terms. This is very helpful in understanding the second component of the traditional account of knowledge. Before moving on to the final component of the traditional account it is worth pausing to briefly consider one further important facet of truth: verisimilitude ("truthlikeness").

As we already know, truth is a major component of knowledge—you cannot know that *p* unless *p* is true. In fact, truth is what we aim at in any legitimate inquiry. We inquire as to the truth of matters. Truth is what we aim at, but we do not always hit our target. Interestingly, we do not always miss our mark by the same amount. For example, if Jill says "$5 + 7 = 13$" and Jack says "$5 + 7 = 879$", both are clearly mistaken. Still, it seems that even though both Jill and Jack have missed the truth, Jill is much closer to it than Jack is. It seems that Jill's claim "$5 + 7 = 13$" has more verisimilitude, or truthlikeness, than Jack's.

It is not very surprising that some false claims such as Jill's are closer to the truth than others like Jack's. More surprising is the fact that some true claims are closer to the *whole* truth about an issue than others. The ultimate goal of our inquiry into any topic is not merely truth, but rather, the whole truth of the matter. Some truths are closer to the whole truth than others. For example, suppose that Billy's hitting a baseball through the window is why it broke. If we are inquiring into the cause of the window's breaking, it is true that <either a rock broke the window or a rock did not break the window>. However, <either a rock broke the window or a rock did not break the window>, while true, is farther from the whole truth than <a baseball broke the window> is. Notice though, both of these propositions are in fact true. This shows that some truths are closer to the full story than others—they have more verisimilitude to the whole truth of the matter.

More surprising still, it seems that sometimes a false claim can be closer to the whole truth about an issue than a true claim. Graham Oddie (2014) asserts that it may be that a truth such as <either electrons are fundamental particles or they are not> is farther from the whole truth than the falsehood that <electrons, protons, and neutrons are fundamental components of atoms>. The reason that this latter claim seems closer to the whole truth is that it is providing more information about the topic under consideration even though some of that information is not correct. While the total information provided is not exactly correct, it does seem to be getting us closer to the whole truth than the vacuously true claim that <either electrons are fundamental particles or they are not>. If this is correct, then it appears that sometimes falsehoods can be more verisimilitudinous than truths.

At this point we have seen a variety of things about verisimilitude. Some falsehoods are closer to the whole truth than other falsehoods. Some truths are closer to the whole truth than other truths. Some falsehoods seem closer to the whole truth than some truths. These facts about verisimilitude relate to our purpose of better understanding the truth component of knowledge in at least two ways.

First, recognizing that various truths (and falsehoods) can be closer to the whole truth than others helps to deepen our understanding of the nature of truth.[20] Second, appreciation of verisimilitude and recognition of the fact that knowledge requires truth, not truthlikeness but truth full stop, may give us reason to think that the proper focus when understanding NOS (and other issues of particular importance to science education) is not really knowledge in the strict sense at all. It seems that recognizing these facts about knowledge and verisimilitude gives us some reason to think that what really matters for scientific inquiry is the *evidence* we have in support of particular claims and theories rather than knowledge.[21] Fortunately, for our purposes we can continue to speak in terms of knowledge, but we are well served by keeping in mind that perhaps what we are really talking about is evidence for claims and whether we are justified in believing those claims.

4.5 Conclusion

We have seen that the best way to understand the nature of truth, at least with respect to our purposes and perhaps in general, is as realists claim. Truth depends on correctly describing an objective, mind-independent reality. It is this reality that we study in the sciences, and scientific knowledge is knowledge of the features of this objective, mind-independent reality. Now that we have a handle on the nature of truth it is time to turn our attention to the final component of the traditional account of knowledge: *justification*.

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[20]There are very deep and important issues concerning how best to determine the degree of verisimilitude that a particular claim enjoys. The various measures of verisimilitude that have been offered are complex, and the debate concerning which is correct is quite intricate. Luckily, we do not need to enter into the details of these measures or the debate concerning their veracity here. A general appreciation of verisimilitude is all that is required for our purposes. For more on these measures and the surrounding debate see Newton-Smith (1981), Niiniluoto (1987), Oddie (1986, 2014), Popper (1963), Tichý (1978), and Zwart (2001).

[21]We will see in chapter eight that the fact that there is a serious problem with the traditional account of knowledge also gives us reason to think that our focus should be on evidence and justification rather than knowledge when we are trying to increase understanding of NOS.

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