

Chapter 8

A Problem for the Traditional Account of Knowledge

Abstract This chapter begins by briefly recapping what has been discovered about the traditional account of knowledge throughout the previous chapters. The traditional account of knowledge holds that one has knowledge of some proposition just in case one justifiedly believes the proposition, and the proposition is true. As earlier chapters showed, believing a proposition requires having an appropriate mental representation of the proposition, being justified in believing the proposition requires believing on it on the basis of sufficiently strong evidence, and a proposition's being true consists of it accurately describing objective reality. After the traditional account of knowledge has been made clear, a decisive objection to that account of knowledge is explained: the Gettier Problem. In addition to explaining how the Gettier Problem shows that the traditional account of knowledge is incomplete this chapter explores some promising responses to the Gettier Problem. Finally, the chapter concludes by noting that even without an answer to the Gettier Problem we can use the traditional account of knowledge as a framework for understanding scientific knowledge.

Now that we have covered the various components of the traditional account of knowledge in some detail we are in a position to spell out the traditional account more fully than we did initially.

Traditional Account of Knowledge

S knows that p if and only if:

- 1) S believes that p (has a mental representation of p and is guided by that representation—takes p as true)
- 2) p is true (p correctly describes objective, mind-independent reality)
- 3) S's belief that p is justified (S has sufficiently strong evidence for thinking that p is true, and S bases her belief that p on that evidence)

Philosophers almost universally accepted this conception of the nature of knowledge for hundreds of years (BonJour 2010a). In fact, as we noted in chapter two, something like the traditional account of knowledge has formed the foundation for thinking about knowledge for more than 2000 years. Despite its long and impressive history almost all philosophers now agree that the traditional account of knowledge has been refuted (BonJour 2010a; Feldman 2003; Hetherington 2005; Jenkins-Ichikawa and Steup 2014; Steup 1996). The refutation of the traditional account of knowledge comes at the hand of Gettier cases, named after Edmund Gettier

who is credited with bringing this class of problems for the traditional account to the forefront of discussions of the nature of knowledge.¹ In this chapter we will explore the Gettier Problem and its implications for our understanding of the nature of knowledge.

8.1 Gettier's Cases

The best place to start exploring the Gettier Problem is with Edmund Gettier's original cases. Here is the first:

COINS²

Suppose that Smith and Jones have applied for a certain job. And suppose that Smith has strong evidence for the following conjunctive proposition:

(d) Jones is the man who will get the job, and Jones has ten coins in his pocket.

Smith's evidence for (d) might be that the president of the company assured him that Jones would in the end be selected, and that he, Smith, had counted the coins in Jones's pocket ten minutes ago. Proposition (d) entails:

(e) The man who will get the job has ten coins in his pocket.

Let us suppose that Smith sees the entailment from (d) to (e), and accepts (e) on the grounds of (d), for which he has strong evidence. In this case, Smith is clearly justified in believing that (e) is true. But imagine, further, that unknown to Smith, he himself, not Jones, will get the job. And, also, unknown to Smith, he himself has ten coins in his pocket. (Gettier 1963, p. 122)

Although Smith's belief that (e) is justified and true, it does not seem that Smith *knows* that (e), <the man who will get the job has ten coins in his pocket>.

Here is Gettier's other case:

TRIP

Let us suppose that Smith has strong evidence for the following proposition:

(f) Jones owns a Ford.

Smith's evidence might be that Jones has at all times in the past within Smith's memory owned a car, and always a Ford, and that Jones has just offered Smith a ride while driving a Ford. Let us imagine, now, that Smith has another friend, Brown, of whose whereabouts he is totally ignorant. Smith selects three place-names quite at random, and constructs the following three propositions:

(g) Either Jones owns a Ford, or Brown is in Boston;

(h) Either Jones owns a Ford, or Brown is in Barcelona;

¹Interestingly, Gettier's famous paper describing these problems was published in 1963, but Bertrand Russell (1912) described what is essentially a Gettier case involving a stopped clock. Chisholm (1977) notes that Alexius Meinong discussed these sorts of cases even earlier in 1906. Although Meinong and Russell first discussed the sort of case that Gettier made famous, Gettier is credited with discovering them. Plausibly, the reason for this is that Gettier emphasized the impact that such cases have on the traditional account of knowledge, but Meinong and Russell did not. Whatever the reason, the subsequent literature has credited Gettier with raising the issue and even refers to fixing the traditional account of knowledge so that it yields the intuitive correct results in Gettier cases as the "Gettier Problem".

²Here I give names to both of Gettier's cases in order to make them easier to refer to in the text. In the original he simply refers to them as "*Case I*" and "*Case II*".

(i) Either Jones owns a Ford, or Brown is in Brest-Litovsk.

Each of these propositions is entailed by (f). Imagine that Smith realizes the entailment of each of these propositions he has constructed by (f), and proceeds to accept (g), (h), and (i) on the basis of (f). Smith has correctly inferred (g), (h), and (i) from a proposition for which he has strong evidence. Smith is therefore completely justified in believing each of these three propositions. Smith, of course, has no idea where Brown is. But imagine now that two further conditions hold. First, Jones does not own a Ford, but is at present driving a rented car. And secondly,

by the sheerest coincidence, and entirely unknown to Smith, the place mentioned in proposition(h) happens really to be the place where Brown is. (Gettier 1963, pp. 122–23)

Again, Smith's belief that (h) is justified and true, but it does not seem that he knows (h).

COINS and TRIP both seem to clearly demonstrate that the traditional account of knowledge is flawed. In both cases Smith has a justified true belief that, intuitively, is not an instance of knowledge. Admittedly, both of these cases are a bit strange and a little far-fetched. However, the traditional account of knowledge is supposed to account for knowledge in *all possible* cases. COINS and TRIP, while strange, are not impossible. Since they are possible situations, the traditional account, if true, must hold in them. Yet, in both of these cases it seems that the traditional account of knowledge fails. In other words, COINS and TRIP seem to clearly demonstrate that it is possible to satisfy all three of the conditions of the traditional account of knowledge and still fail to have knowledge. Gettier's cases show that justified true belief is not sufficient for knowledge. Thus, Gettier's cases have refuted the traditional account of knowledge.

8.2 Initial Responses to the Gettier Problem

Despite the widespread agreement that Gettier's cases show that the traditional account of knowledge is mistaken, most philosophers accept that something *like* the traditional account is correct. In fact, although it is accepted that Gettier's cases show that the three conditions of the traditional account are not sufficient for knowledge, it is widely accepted that they are necessary for it (BonJour 2010a; Feldman 2003; Hetherington 2005; Steup 1996). That is to say, Gettier showed that having a justified true belief that p is not enough to know that p , but his cases do not show that you can know that p without having a justified true belief that p . It is still commonly held that justified true belief is necessary for knowledge.

Since most philosophers hold that justified true belief is necessary for knowledge, the majority of responses to the Gettier Problem involve adding a fourth condition to the three conditions of the traditional account of knowledge. The purpose of this fourth condition is to rule out beliefs like Smith's in Gettier's cases from counting as knowledge. Before examining some of the fourth conditions that have been proposed, it will be instructive to consider a couple responses that seek to fix the traditional account of knowledge without adding a further condition to the original three.

It is apparent that both COINS and TRIP rely on two important assumptions. First, in both cases it is assumed that it is possible for someone to have a justified false belief. In both cases Smith infers the true proposition from a justified false belief that he has—(d) in COINS and (f) in TRIP. Second, in both cases it is assumed that it is possible to become justified in believing a proposition by deducing it from things you justifiedly believe. That is to say, both cases involve Smith deducing other propositions from his justified false beliefs. Given that Gettier's cases rely on two assumptions, two initial responses to the Gettier Problem jump out at us. Deny one or the other of the assumptions at work in Gettier's cases. Unfortunately, neither of these responses is very plausible. Let us take a look at each.

One way to avoid the Gettier Problem is to simply deny that it is possible to have justified false beliefs.³ The idea here would be to maintain that one must have infallible evidence in support of p in order to be justified in believing that p . Infallible evidence is evidence that is so strong that it is not possible to have that evidence for p when p is false. This would avoid the Gettier Problem because in Gettier's cases Smith does not have infallible evidence in support of either (d) or (f). On this view of what is required for justification Smith would not be justified in believing (d) or (f). Without justified beliefs in these propositions Smith's inferences to the problematic propositions in these cases would not be justified. Thus, Smith would not be justified in believing (e) or (h). Therefore, there would be no justified true belief which fails to be knowledge in either of these cases because the problematic belief would not be justified at all. And so, there would be no problem for the traditional account of knowledge.

While it might be tempting to think that we can avoid the Gettier Problem by accepting that justification requires infallible evidence, this cannot be correct. At least, it cannot be correct if we have hardly any justified beliefs at all. Requiring infallible evidence for justification straightforwardly leads to a thoroughgoing skepticism. At times our perceptual experiences can fail to be accurate. That is to say, sometimes we are subject to illusions, hallucinations, or simply misleading perceptual information. A clear example of this occurs in the famous Müller-Lyer illusion. In this illusion line segments of the same length appear to be different lengths because of the placement of arrow "heads" or "tails" on the line segment. This illusion and many others demonstrate that our perceptual experiences do not provide us with infallible evidence. Moreover, it is exceedingly plausible that, for any given perceptual experience you have, it is possible that the experience is misleading. This creates a severe problem for the view that justification requires infallible evidence. If you must have evidence of this strength in order to be justified in believing something, you are not even justified in believing that you are currently reading this book! After all, it is possible that you have your current evidence (perceptual experiences), which supports believing that you are currently reading

³This is the sort of view of justification made famous by Descartes (1641/1988). The Gettier Problem prompted a couple other epistemologists to seriously consider this view of justification too. See Lehrer (1971) and Unger (1971) for endorsements of this view.

this book, and yet you are not reading a book at all. It could be that you are having a very vivid hallucination as of reading this book, or you are in fact dreaming that you are currently reading this book. Admittedly, neither of these possibilities is at all likely to be true, but they are *possibilities* nonetheless. Since they are possible, the evidence that you have for thinking you are reading this book is not infallible. If we accept that infallible evidence is required for justification, then you are not justified in believing that you are reading this book. This sort of problem arises for all of your other beliefs about the world around you. Further, the evidence you gain from memory does not satisfy this infallibility requirement either. So, you would not be justified in believing the things you seem to remember. Similar considerations apply to most all of your beliefs. Thus, if we attempt to avoid the Gettier Problem by requiring infallible evidence for justification, we are stuck with a very extreme form of skepticism. In this case we would be avoiding one problem by embracing a much worse one.

A second way to avoid the Gettier Problem that might seem attractive, at least initially, is to deny that it is possible to become justified in believing a proposition by deducing it from things you justifiedly believe. However, once we think about this more carefully it becomes clear that this is not a very plausible response either. Intuitively, it seems that if you justifiedly believe that p , and you justifiedly believe that $\langle p \text{ entails } q \rangle$, then you should be in a position to justifiedly believe that q on the basis of an inference from p and $\langle p \text{ entails } q \rangle$. This response to the Gettier problem would deny this intuition though. According to this response, when you justifiedly believe that you are reading this book, and you justifiedly believe that if you are reading this book, then you know how to read, you cannot justifiedly believe that you know how to read by inferring it from these two justified beliefs. Denying that you can become justified in believing a proposition by deducing it from things you justifiedly believe is highly implausible. Again, such a response seems to avoid one problem by embracing an even worse one. What is more, this sort of response cannot handle all Gettier style cases—it fails in both Chisholm’s (1977) “sheep in the field” case and Goldman’s (1976) “fake barn” case, both of which are described below. Not surprisingly, few philosophers have accepted either of these responses.

8.3 A Fourth Condition for Knowledge?

Since the initial “quick fixes” to the Gettier Problem are implausible, philosophers have tried other responses. As we noted above, the typical strategy is to add a fourth condition designed to block the problem that arises for the traditional account of knowledge in Gettier cases. An early attempt at such a fourth condition which has some initial plausibility is what is sometimes called the “no false lemmas” (Jenkins-Ichikawa and Steup 2014) or “no false grounds” (Feldman 2003) response. Michael Clark (1963) put this response forward shortly after the publication of Gettier’s original presentation of the problem. According to this response, the

Gettier Problem can be solved by adding the following condition to the traditional account of knowledge:

All of S's grounds for believing p are true (Feldman 2003, p. 31).

The idea encapsulated in this condition is that the reasons S has for believing that p must all be true. In other words, S cannot know that p if she bases her belief that p on something false.

At first glance the no false grounds response seems to fare well. In both of Gettier's cases Smith has false grounds. In COINS Smith bases his belief that (e), <the man who will get the job has ten coins in his pocket>, on (d), <Jones is the man who will get the job, and Jones has ten coins in his pocket>. But, (d) is false. Hence, according to the no false grounds response, Smith fails to know that (e), which is the intuitively correct result. Similarly, in TRIP Smith bases his belief on a false ground. In this case Smith bases his belief that (h), <either Jones owns a Ford, or Brown is in Barcelona> on his false belief that (f), <Jones owns a Ford>. Thus, again the no false grounds response yields the intuitive result that Smith does not know that (h) is true.

Despite its ability to handle Gettier's original cases, the no false grounds response fails for two reasons. First of all, there are other Gettier style cases for which it does not give the right results.⁴ Here is one from Roderick Chisholm (1977, p. 105):

A man takes there to be a sheep in the field and does so under conditions which are such that, when a man does thus take there to be a sheep in the field, then it is evident to him that there is a sheep in the field. The man, however, has mistaken a dog for a sheep and so what he sees is not a sheep at all. Nevertheless, unsuspected by the man, there is a sheep in another part of the field.

Chisholm's example seems to be a Gettier style case—the man has a justified true belief that there is a sheep in the field, but intuitively he lacks knowledge. The no false grounds response does not seem to rule out the man's knowing there is a sheep in the field in this case though. The reason for this is that the man does not seem to be basing his belief that there is a sheep in the field on a false ground. He is basing his belief directly on his visual experience and his background knowledge of what sheep look like. As a result, it seems that the no false grounds approach is not up to the task of saving the traditional account of knowledge from the general threat of Gettier style cases.

An additional problem for the no false grounds response is that it seems to lead to skepticism. It is plausible that there will often, if not always, be some false ground that plays a role in the beliefs we form in ordinary cases (Hetherington 2005). If this is true, then according to the no false grounds response most, if not all, of our justified beliefs will fall short of knowledge. This skeptical concern has led some epistemologists to modify the no false grounds approach to the “no *essential* dependence on a falsehood” response (Feldman 2003; Harman 1973; Lehrer 2000; Lycan 2006).

⁴For additional Gettier style cases where it does not seem that the person is relying on a false ground see Feldman (1974), Goldman (1976), and Lehrer (1979).

According to the no essential dependence on a falsehood response, having knowledge does not require that you have no false grounds for the known proposition. Instead, this response adds the following fourth condition to the traditional account of knowledge:

S's justification for p does not essentially depend on any falsehood (Feldman 2003, p. 37).

The idea here is that even if S bases her belief on something false that does not automatically rule out her having knowledge. In order for S to fail to know it has to be that the bases of her belief that p which remain after we have taken away the falsehoods are not sufficient for justification. For instance, if Marisa believes that there is a tree in her yard because she has a visual experience of a tree and because she believes it is a logical impossibility for someone to have a yard and not have a tree in it, her belief could still count as knowledge. According to the no essential dependence on a falsehood response, Marisa's belief may still be an instance of knowledge because even without her false belief that it is a logical impossibility for someone to have a yard and not have a tree in it, Marisa's belief is still justified by her visual experience.

The no essential dependence upon a falsehood response improves upon the no false grounds response because it does not seem to have the same skeptical problems. Yet, one might worry that it still faces a problem with Gettier style cases like Chisholm's sheep in the field case. Richard Feldman (2003) claims that the no essential dependence on a falsehood response yields the intuitively correct result in Chisholm's case though. He maintains that the man's belief that there is a sheep in the field "depends essentially on the proposition that what he sees is a sheep", and that belief is false (Feldman 2003, p. 36). So, Feldman claims the no essential dependence on a falsehood response gives the intuitive result that the man does not know there is a sheep in the field.

Perhaps this is correct, though it is not clearly so (Steup 1996). After all, it is not clear that the man forms a belief that what he sees is a sheep. It is plausible that he simply has a visual experience as of a sheep and immediately forms the belief that there is a sheep in the field. Even if this response works for Chisholm's case, another Gettier style case seems to pose a problem for the no essential dependence on a falsehood response though:

Henry is driving in the countryside with his son. For the boy's edification Henry identifies various objects on the landscape as they come into view. "That's a cow," says Henry, "That's a tractor," "That's a silo," "That's a barn," etc. Henry has no doubt about the identity of these objects; in particular, he has no doubt that the last-mentioned object is a barn, which indeed it is. Each of the identified objects has features characteristic of its type. Moreover, each object is fully in view, Henry has excellent eyesight, and he has enough time to look at them reasonably carefully, since there is little traffic to distract him. . . . unknown to Henry, the district he has just entered is full of papier-mâché facsimiles of barns. These facsimiles look from the road exactly like barns, but are really just facades, without back walls or interiors, quite incapable of being used as barns. They are so cleverly constructed that travelers invariably mistake them for barns. Having just entered the district, Henry has not encountered any facsimiles; the object he sees is a genuine barn. But if the object on that site were a facsimile, Henry would mistake it for a barn. (Goldman 1976, pp. 772–73)⁵

⁵Although Goldman was the first to publish this example, he credits Carl Ginet with coming up with the fake barn case.

In this “fake barn” Gettier-style example it seems that Henry has a justified true belief that the object is a barn, but the belief does not amount to knowledge. It is far from clear that the no essential dependence on a falsehood response can yield the intuitively correct result in this case. No falsehood immediately stands out as being essential for Henry’s justification for thinking that he sees a barn. Thus, it seems the no essential dependence on a falsehood response is problematic as well.⁶

While there are a number of responses that seek to provide the elusive fourth condition that will fix the traditional account of knowledge, none of them have been widely accepted. Rather than catalog these various responses and their problems, we will turn our attention to responses to the Gettier Problem that do not attempt to provide a fourth condition.⁷

8.4 Other Responses to the Problem

The difficulty of the Gettier Problem and the lack of consensus concerning proposed responses have led some to think that a solution of the sort we are after is simply not to be had. Linda Zagzebski (1994) argues that the only way to avoid the Gettier Problem is to either make justification so strict that it entails the truth of the relevant proposition (the infallibilist response from above) or to divorce justification from truth to the point that even in the Gettier cases the person has knowledge. We have already noted that the infallibilist response has implausible skeptical consequences. Although some have taken the second approach that Zagzebski mentions, it is far from popular.⁸ There is good reason for this—the intuition that the subject fails to know is one of the most widely held intuitions in contemporary epistemology; almost everyone agrees that the subject lacks knowledge in these cases.⁹ In light of these considerations, neither of these options seems to be all that promising.

⁶Most philosophers think that fake barn cases are Gettier cases, but see Gendler and Hawthorne (2005) for some reasons to think that fake barn cases are not genuine Gettier cases. Of course, if such cases are not genuine Gettier cases, then the no essential dependence on a falsehood response is in better shape than it appears at this point.

⁷See Lycan (2006), Shope (1983), and Turri (2012a) for overviews of the various responses to the Gettier Problem that have been put forward and the difficulties facing each of these responses.

⁸See Butchvarov (1970) for a view of knowledge that is amenable to this sort of response. See Hetherington (1998, 2001) and Turri (2012b) for recent attempts to make this approach more palatable.

⁹Almost all philosophers accept the intuition at play in the Gettier style cases (that the subject lacks knowledge of the proposition in question). Nonetheless, some have argued that survey research suggests that non-philosophers may not always share this intuition, see Weinberg et al. (2001). These results have been challenged on the ground that there is merely a verbal disagreement between what non-philosophers are claiming and the intuition held by philosophers (Sosa 2007, 2009). Others argue that the intuitions of non-philosophers are not important in this case because they lack the sort of training that makes one good at evaluating abstract cases like Gettier style cases (Ludwig 2007; Williamson 2007). Still others have conducted additional survey research with the result that non-philosophers share the same intuition as philosophers about this sort of case (Turri 2013). So, at present it appears safe to say that the intuition that the subject in a Gettier-style case lacks knowledge is on pretty firm ground.

Others have taken the history of the Gettier Problem and the failure of various attempts to solve the problem to show that it cannot be solved. This has helped give rise to the “knowledge first” approach to epistemology (Williamson 2000). Essentially, this approach to epistemology holds that knowledge is an unanalyzable concept—we can never give an acceptable full analysis of the necessary and sufficient conditions for knowledge. Despite its being unanalyzable, supporters of this approach to epistemology hold that knowledge is an important concept that can be used to analyze other important epistemic concepts such as justification. Importantly, those who accept this approach, such as its most prominent defender, Timothy Williamson (2000), allow that even though knowledge is not susceptible to complete analysis there are still necessary and sufficient conditions for knowledge that can be identified, and it can be quite informative to identify them. Not surprisingly, the break with traditional epistemology that the knowledge first approach advocates is very controversial.¹⁰

The rise of the knowledge first approach as well as a general dissatisfaction with responses to the Gettier Problem have led some to think that philosophers should not be focused on analyzing knowledge at all. Several philosophers have argued that it is not knowledge that we should be concerned about anyway, but rather, we should be concerned with things like justification and evidence.¹¹ We tentatively reached a similar conclusion in chapter four when discussing verisimilitude. Recognizing the importance of the concept of verisimilitude and appreciating the fact that knowledge requires truth, not truthlikeness but truth full stop, provides reason for thinking that it is not really knowledge in the strict sense that we should be concerned with at all. These facts about knowledge and verisimilitude give us some reason to think that what really matters for scientific inquiry, and inquiry in general, is the *evidence* we have in support of particular claims and theories rather than knowledge. Of course, this does not mean that we cannot use the term “knowledge” to signify a particularly high cognitive ideal, but it does mean that we may want to rethink our general focus.

8.5 The Move Away from Knowledge

When faced with the difficulty of solving the Gettier Problem many philosophers opt for picking an initially plausible response (one that seems to handle most of the central Gettier-style cases) and continuing to work with the traditional account (Feldman 2003). This sort of approach would suffice for our purposes. Nevertheless, it is worth briefly considering here what effect moving away from concentrating on knowledge to focusing on justification and evidence would have on our understanding of NOS.

¹⁰For criticisms of this approach see the essays collected in Greenough and Pritchard (2009).

¹¹See BonJour (2010a, b), Goodman and Elgin (1988), Elgin (1996), Kaplan (1985), and Kvanvig (1998, 2003).

Some commonly held aspects of NOS seem to make more sense when construed in terms of evidence and justification rather than knowledge. For instance, it is much more plausible that a theory which we are justified in believing to be true is tentative than it is that a theory we *know* to be true is tentative. Plausibly, when we speak of “scientific knowledge” what we really mean is scientific claims for which we have sufficient evidence to think they are true (or approximately true to a specific degree). Often, we are not careful to distinguish between knowledge and justified belief—as we have seen, there is perhaps a good reason for this since it is so difficult to say exactly what knowledge is. It seems that our focus is really not on knowledge at all, but rather on the sort of evidence, and methods of gaining that evidence, that can justify us in believing particular scientific claims are true.

In spite of the potential theoretical benefit of moving away from a strict focus on knowledge and the fact that we seem to be most concerned with evidence and justification anyway, it seems that there are practical reasons for continuing to use the *term* “scientific knowledge”. Shifting from talking about scientific knowledge to theories and claims that are justified or reasonable to believe in light of the evidence may lead to the mistaken thought that many of our best scientific theories and laws are “just theories”. This is a common, misguided objection to evolutionary theory.¹² Additionally, it is useful to continue to talk about scientific knowledge because doing so may help to avoid the problem of failing to distinguish well-supported facts in science from things that one merely believes.¹³ In light of these concerns, it may be best to continue to employ the term “scientific knowledge” even though when we do so we are not particularly concerned with whether the state we are describing satisfies whatever condition might be necessary to solve the Gettier Problem. It is evidence and justification that we really care about. Nevertheless, the term “scientific knowledge” may be employed to signify beliefs that satisfy the conditions of the traditional account of knowledge. Of course, as we have noted, even without a complete analysis of knowledge it is exceedingly plausible that the three conditions of the traditional account are required for knowledge. It is because of this that often our discussions of beliefs for which we satisfy the conditions of the traditional account are discussions of knowledge. This is so because these discussions are concerned with whether a particular belief satisfies various necessary components of knowledge.

8.6 Conclusion

In this chapter we have explored a major problem facing the traditional account of knowledge, the Gettier Problem. The Gettier Problem shows that the three conditions of the traditional account are not sufficient for knowledge. We have

¹²See McCain and Weslake (2013) for discussion of this and other misguided objections to evolution.

¹³See Kampourakis (2014) for discussion of this problem.

considered some of the many responses to this problem and seen that they are problematic. Unfortunately, this seems to be the case with all responses to the Gettier Problem. Despite the difficulty of responding to the Gettier Problem we can still continue on our path of exploring the philosophical foundation for understanding scientific knowledge. Although we have seen that it is possible to change our focus from scientific knowledge to evidence and justification for scientific claims, we will continue to use the term “scientific knowledge” and will focus on the key components of the traditional account of knowledge. In doing this we can work with the assumption that something along the lines of the traditional account of knowledge is correct—if one is unwilling to grant this assumption, we can still continue to focus on knowledge; we simply need to do so with the understanding that it is the justification component and its reliance upon evidence that is most central to our investigation.

We have now completed Part I of this book. Throughout the chapters of this part we have explored many issues related to the traditional account of knowledge. We have seen that there are a number of live philosophical debates concerning various important components of knowledge. Although we often had to leave these debates unresolved, merely appreciating the foci of these debates and some of the major positions in the debates has helped to provide us with a fairly broad basis from which to understand the general features of knowledge. The understanding of the general features of knowledge afforded by our examination of the facets of the traditional account of knowledge provides us with a solid framework for better understanding NOS and the debates surrounding this important concept. We will now begin to narrow our focus from knowledge in general to an exploration of aspects of scientific knowledge in particular.

References

- BonJour, L. (2010a). *Epistemology: Classic problems and contemporary responses* (2nd ed.). Lanham: Rowman & Littlefield.
- BonJour, L. (2010b). The myth of knowledge. *Philosophical Perspectives*, 24, 57–83.
- Butchvarov, P. (1970). *The concept of knowledge*. Evanston: Northwestern University Press.
- Chisholm, R. M. (1977). *Theory of knowledge* (2nd ed.). Englewood Cliffs: Prentice Hall.
- Clark, M. (1963). Knowledge and grounds: A comment on Mr. Gettier’s paper. *Analysis*, 24, 46–48.
- Descartes, R. (1641/1988). *Meditations on first philosophy*. In J. Cottingham, R. Stoothoff, & D. Murdoch (Trans.), *Descartes: Selected philosophical writings* (pp. 73–123). Cambridge, UK: Cambridge University Press.
- Elgin, C. Z. (1996). *Considered judgment*. Princeton: Princeton University Press.
- Feldman, R. (1974). An alleged defect in Gettier counter-examples. *Australasian Journal of Philosophy*, 52, 68–69.
- Feldman, R. (2003). *Epistemology*. Upper Saddle River: Prentice Hall.
- Gendler, T. S., & Hawthorne, J. (2005). The real guide to fake barns: A catalogue of gifts for your epistemic enemies. *Philosophical Studies*, 124, 331–352.
- Gettier, E. L. (1963). Is justified true belief knowledge? *Analysis*, 23, 121–123.

- Goldman, A. I. (1976). Discrimination and perceptual knowledge. *Journal of Philosophy*, 73, 771–791.
- Goodman, N., & Elgin, C. Z. (1988). *Reconceptions in philosophy & other arts & sciences*. Indianapolis: Hackett.
- Greenough, P., & Pritchard, D. (2009). *Williamson on knowledge*. Oxford: Oxford University Press.
- Harman, G. (1973). *Thought*. Princeton: Princeton University Press.
- Hetherington, S. (1998). Actually knowing. *Philosophical Quarterly*, 48, 453–469.
- Hetherington, S. (2001). *Good knowledge, bad knowledge: On two dogmas of epistemology*. Oxford: Oxford University Press.
- Hetherington, S. (2005). Gettier problems. *Internet Encyclopedia of Philosophy*. <http://www.iep.utm.edu/gettier/>
- Jenkins-Ichikawa, J. & Steup, M. (2014). The analysis of knowledge. In E. N. Zalta (Ed.), *The Stanford encyclopedia of philosophy* (Spring 2014 Edition). <http://plato.stanford.edu/archives/spr2014/entries/knowledge-analysis/>
- Kampourakis, K. (2014). *Understanding evolution*. Cambridge, UK: Cambridge University Press.
- Kaplan, M. (1985). It's not what you know that counts. *Journal of Philosophy*, 82, 350–363.
- Kvanvig, J. (1998). Why should enquiring minds want to know? Meno problems and epistemological axiology. *Monist*, 81, 426–452.
- Kvanvig, J. (2003). *The value of knowledge and the pursuit of understanding*. Cambridge, UK: Cambridge University Press.
- Lehrer, K. (1971). Why not scepticism? *Philosophical Forum*, 2, 283–298.
- Lehrer, K. (1979). The Gettier Problem and the analysis of knowledge. In G. Pappas (Ed.), *Justification and knowledge* (pp. 65–78). Dordrecht: Reidel.
- Lehrer, K. (2000). *Theory of knowledge* (2nd ed.). Boulder: Westview Press.
- Ludwig, K. (2007). The epistemology of thought experiments: First vs. third person approaches. *Midwest Studies in Philosophy*, 31, 128–159.
- Lycan, W. G. (2006). On the Gettier Problem problem. In S. Hetherington (Ed.), *Epistemology futures* (pp. 148–168). Oxford: Oxford University Press.
- McCain, K., & Weslake, B. (2013). Evolutionary theory and the epistemology of science. In K. Kampourakis (Ed.), *The philosophy of biology: A companion for educators* (pp. 101–119). Dordrecht: Springer.
- Russell, B. (1912). *The problems of philosophy*. London: Williams and Norgate.
- Shope, R. K. (1983). *The analysis of knowing: A decade of research*. Princeton: Princeton University Press.
- Sosa, E. (2007). Experimental philosophy and philosophical intuitions. *Philosophical Studies*, 132, 99–107.
- Sosa, E. (2009). A defense of the use of intuitions in philosophy. In D. Murphy & M. Bishop (Eds.), *Stich and his critics* (pp. 101–112). Malden: Blackwell.
- Steup, M. (1996). *An introduction to contemporary epistemology*. Upper Saddle River: Prentice Hall.
- Turri, J. (2012a). In Gettier's wake. In S. Hetherington (Ed.), *Epistemology: The key thinkers* (pp. 214–229). London: Continuum.
- Turri, J. (2012b). Is knowledge justified true belief? *Synthese*, 184, 247–259.
- Turri, J. (2013). A conspicuous art: Putting Gettier to the test. *Philosophers' Imprint*, 13. <http://quod.lib.umich.edu/p/phimp/3521354.0013.010/1>
- Unger, P. (1971). A defense of skepticism. *Philosophical Review*, 30, 198–218.
- Weinberg, J., Nichols, S., & Stich, S. (2001). Normativity and epistemic intuitions. *Philosophical Topics*, 29, 429–460.
- Williamson, T. (2000). *Knowledge and its limits*. Oxford: Oxford University Press.
- Williamson, T. (2007). *The philosophy of philosophy*. Malden: Blackwell.
- Zagzebski, L. (1994). The inescapability of Gettier problems. *Philosophical Quarterly*, 44, 65–73.