10 In Defense of Wishful Thinking

James, Quine, Emotions, and the Web of Belief

Alexander Klein

Certainly I'm much more sympathetic with Dewey than other pragmatists so called, notably William James. There are two points where I depart radically from James: one, his pragmatic theory of truth, second his "Will to believe," which seems to me to be a way of giving aid and comfort to wishful thinkers.
—W. V. O. Quine, from a discussion with Lars Bergström and Dagfinn Føllesdal (Føllesdal 2001: 65–6)

1 Introduction

Quine and James both held that I must adjust my web of belief when I face a recalcitrant perceptual experience. But am I ever warranted in adjusting my beliefs to a recalcitrant *emotion?* This question provides a lens for bringing into focus the relationship between Quine and James, and ultimately between Quine and classical pragmatism at large.

Among the growing list of scholars who have considered Quine's relationship to the pragmatist tradition, the lumpers have handily outnumbered the splitters. Quine's own protestations notwithstanding, he has been lumped with pragmatism on grounds of an allegedly direct historical influence, typically through either C. S. Peirce or C. I. Lewis,[1] or he has been lumped with pragmatism on grounds of supposed philosophical affinity.[2]

There have been some skeptics about Quine's pragmatist *bona fides*, though, not the least Quine himself. In this essay, I throw myself in with these splitters.[3]

I begin by outlining Quine's "web of belief" model of theory confirmation, an aspect of his work that is often supposed to place him in community with pragmatists like James in particular. Quine and James agree that we must manage our beliefs as a corporate body. And they agree that pragmatic considerations like simplicity and elegance must enter the picture when a choice between beliefs or theories is underdetermined by available evidence. But despite these real affinities, I point out a clear tension: in cases of underdetermination, James (but not Quine) suggests that agents are also permitted to take into consideration the emotional ramifications of a new belief or theory.

This opens James to the worry Quine raises in my epigraph: isn't it bad epistemic practice to allow one's hopes or fears to cloud one's judgment about which descriptions of the world are actually true? I defend James by offering a case study from the history of medicine. The Australian physician Barry Marshall is widely credited with co-discovering the bacterial cause of peptic ulcer disease. For reasons I will explain, he had trouble establishing this result through nonhuman animal experimentation. So at a time when his attempts to collect high quality evidence had been stymied, he purposefully swallowed a vial of the bacteria himself. The case illustrates how emotional concerns sometimes *do* play an auspicious role in inquiry, just as James suggests.

Finally, I offer a diagnosis of the disagreement between James and Quine. Although Quine's naturalism was designed as an alternative to Carnapian rational reconstruction, Quine tacitly retains one of logical positivism's crucially anti-pragmatist commitments—that philosophy of science should focus exclusively on the context of justification, not the context of discovery (the distinction is originally from Reichenbach 1938: 6–7). To be sure, Quine rejects the notion that we have access to purely a priori logical principles that can be used to reconstruct the justificatory status of our best scientific theories—that is, he rejects the *logic* of justification. But his naturalistic alternative is emphatically not a turn toward what the pragmatists all called "inquiry"—it is not a turn toward an epistemology of discovery. Instead, Quine proposes a *psychology* (rather than a logic) of justification. His insistence on modeling our scientific commitments as a web of cognitive states that must be squared with pure sense experience, not emotion, reflects his refusal to take seriously an epistemology of discovery.

In contrast, James cannot draw a sharp distinction between discovery and justification, for reasons I discuss at the end of the essay. His account of inquiry must therefore take some view of processes logical positivists wanted to relegate to the supposedly philosophically barren landscape of discovery.

Although pragmatists may disagree on what the proper role of emotion in inquiry *is*, or on how precisely to do good epistemological work more generally,[4] I suggest that pragmatists all share an emphasis on discovery as a (perhaps *the*) crucial locus for epistemological inquiry. Since Quinean epistemology is always an epistemology of *justification*, he is not happily viewed as a member of the pragmatist tradition.

2 Web of Belief

Quine famously concluded his attack on the analytic/synthetic distinction by claiming that the considerations we use to fit our scientific commitments with observation are "where rational, pragmatic" (Quine 1951: 43). Though he later attributed this usage of "pragmatic" to Carnap,[5] many commentators have seen an affinity between Quine's holism and classical

pragmatism. In particular, Quine's claim that when they confront empirical evidence, our beliefs form "a man-made fabric which impinges on experience only along the edges" evokes similarly holistic pronouncements from James (e.g., P: 34–6).

The "web of belief," as Quine came to call it, suggests two distinct sorts of holism—*meaning* holism (the view that the meaning of any belief depends in some way on the web in which it is embedded) and *confirmation* holism (the view that the confirmation or refutation of any belief depends in some way on the web in which it is embedded). In the present discussion, I shall be concerned exclusively with the latter.

Quine typically motivates his confirmation holism by appealing to Duhem-style underdetermination arguments.[6] According to this reasoning, no scientific hypothesis by itself produces a testable prediction—only scientific hypotheses in conjunction with auxiliary hypotheses, plus logical and perhaps mathematical axioms, have empirical import. As a result, Quine's confirmation holism entails that when we adjust the web of belief in response to "recalcitrant experience," we necessarily face at least two related choices that might be construed as "pragmatic." First, we must choose how to redistribute truth values in our existing web, and second, we must choose where to draw a line between beliefs (like those concerning logic and math) we may want to hold true "come what may," and those quasi-empirical beliefs we are more willing to revise (Quine 1951: 40).[7]

Although the phrase "web of belief" does not come from classical pragmatism,[8] there are at least three aspects of this figure that do harken back to James. First, although James does not talk about a *"web"* of belief, he does say that a person accommodates a "new experience" by "modifying his previous mass of opinions" as a corporate body. His preferred metaphor is "a stock of old opinions," where "stock" is apparently meant in the biological sense of a trunk or stem (White 1990: 5). When we have an unexpected experience, we must find a new idea that we can "graft upon the ancient stock with a minimum of disturbance" (P: 34–5). So both Quine and James suggest that "new" or "recalcitrant" experiences must be accommodated by our "opinions" or "beliefs" as a corporate body, and, conversely, both reject the notion that single beliefs are supported by single experiences.[9]

Second, one upshot of Quine's rejecting the analytic/synthetic distinction is that there is allowable flexibility in choosing which of our beliefs to preserve and which to reject in the face of recalcitrant evidence. Although James does not argue directly against the analytic/synthetic distinction, he certainly sounds sympathetic to such a view when he says of our leeway in modifying our stock of beliefs that "[t]o a certain degree, therefore, *everything* here is plastic" (P: 35, emphasis added).

Finally, one thing that guides us in deciding how to warp our "plastic" stock of beliefs, for James, is a general tendency toward "extreme conservativ[ism]"—we try to save as much of the old opinions as we can. Similarly, Quine long proposed that when we accommodate recalcitrant

experience, "[o]ur choice is guided largely by the tendency to dislodge as little of previous doctrine as we can compatibly with the ideal of unity and simplicity" (from Quine's 1934 Carnap lectures, in Creath, Quine, and Carnap 1990: 63).

For all this common background, though, there is an important tension between the two views over the role of emotion. Quine is very clear that what we are to adjust our web of beliefs *to* is a collection *of sensory experience* only—emotion does not figure in. For instance, consider the passage in which the "fabric" metaphor first appears:

> The totality of our so-called knowledge or beliefs, from the most casual matters of geography and history to the profoundest laws of atomic physics or even of pure mathematics and logic, is a man-made fabric which impinges on experience only along the edges. Or, to change the figure, total science is like a field of force whose boundary conditions are experience. A conflict with experience at the periphery occasions readjustments in the interior of the field. Truth values have to be redistributed over some of our statements.
>
> (Quine 1951: 39)

For Quine, our beliefs constitute a "fabric" that we warp to fit "experience." Later in the same essay he writes that a scientist who makes improvements to this fabric is "warping his scientific heritage to fit his continuing sensory promptings" (Quine 1951: 43). So it is clear that by "experience" Quine means *sense* experience.

The notion that epistemically relevant "experience" should be modeled as pure input from our "sensory promptings"—again, as untainted by emotion—is pervasive in Quine's later work as well. For instance, in "Epistemology Naturalized" he writes that the "stimulation of his sensory receptors is all the evidence anybody has had to go on" (Quine 1969: 75). And although the notion that the "fabric" should be understood as a network of "beliefs" gets modified somewhat—Quine sometimes describes our scientific heritage as "a fabric of *sentences*" (Quine 1960a: 374, emphasis added)—nevertheless, he consistently maintains that what is epistemologically relevant is a web of purely descriptive entities (beliefs or sentences) and the logical connections between them.[10] Whether our scientific heritage is understood in terms of mental entities like *beliefs* or in terms of non-mental things such as *sentences*, the upshot is that for the purposes of epistemology Quine thinks there is a dynamic relationship between an agent's logically connected network of descriptions and her ongoing, emotionally untainted sensory promptings.

Quine has some misgivings about the notion of belief, but he does give something like a definition. In the clearest cases, a belief is "a bundle of dispositions. It may include a disposition to lip service, a disposition to accept a wager, and various dispositions to take precautions, or to book passage, or to tidy up the front room, or the like" (Quine 1987: 20). He doubts

that there is anything of substance that really links all these dispositions together beyond a "linguistic quirk"—namely, "the adapter *that*, which can be prefixed thoughtlessly to any and every declarative sentence to produce a grammatically impeccable and hence presumably meaningful direct object for the verb *believes*" (Quine 1987: 21). So if Quine thinks our "scientific heritage"[11] is to be modeled as a web *of beliefs* that must be adjusted to our sensory promptings, then each of the web's nodes are *dispositions* to behave as though some set of propositions were true.

Compare, now, the passage where James gives us his "stock of opinions" metaphor:

> The individual has a stock of old opinions already, but he meets a new experience that puts them to a strain. Somebody contradicts them [the stock of opinions]; or in a reflective moment he discovers that they contradict each other; or he hears of facts with which they are incompatible; *or desires arise in him which they* [the opinions] *cease to satisfy.* The result is an inward trouble to which his mind till then had been a stranger, and from which he seeks to escape by modifying his previous mass of opinions. He saves as much of it as he can, for in this matter of belief we are all extreme conservatives.
>
> (P: 34–5, emphases added)

This italicized phrase introduces a clear and interesting contrast between Quine and James. Where Quine thinks our web of beliefs must harmonize with our sensory promptings, James clearly thinks there are occasions when we must harmonize the web with emotional experiences as well.

This passage has been subject to conflicting interpretations. For instance, (Gale 1999: 126) seems to think the "desires" mentioned in the quoted passage are, in the first instance, part of the *web* that must be adjusted to fit new experience, rather than as part of the new experience to which we *fit* our web. But in fact, James mentions new "desires" in the context of discussing new aspects of experience that do not harmonize with our "stock of old opinions." Thus I read this passage, instead, along the same lines as (White 1990: 9): James and Quine agree that each of us has a web of beliefs that we must harmonize with "experience," but James has a broader conception of "experience" since he intends both sensory promptings *and emotions* to be included under this term.[12]

Now the notion that our beliefs must square not only with our sense experience but also with our desires might smack of exactly the kind of "wishful thinking" worries about James that Quine raised in my epigraph. Indeed, passages like this apparently lend credence to critics who say James thinks that whether or not I find a belief personally satisfying is relevant to whether I should think it true.

Certainly, more recent proponents of Quine's pragmatist credentials have tried to disentangle a thread of the pragmatist tradition that he supposedly occupies, and that minimizes the role of emotion in cognition. In particular, Cheryl

Misak distinguishes C. S. Peirce's holism, which she thinks involves the view that hypotheses must be vindicated or rejected according to whether they "are empirically confirmed, fit with our otherwise grounded knowledge, etc.," from James's fuzzy-headed sentimentalism, according to which hypotheses have to pass the test of being "satisfying to me" (Misak 2013a: 66). She then makes swift work of dividing Quine from the fuzzy-headed James precisely in terms of how each man thinks the confirmation holist should respond to recalcitrant experience:

> Quine thinks that our choices about what to revise, when faced with recalcitrant experience, are based on "pragmatic" choices. He thinks that theories are underdetermined by the evidence. Hence, theory choice, once the evidence has run out, boils down to considerations of simplicity, elegance, and avoiding massive destruction of our well-grounded beliefs.[13] This is not quite the Jamesian idea that when the evidence falls short of determining a belief, we can choose to believe as we will. For Quine and James differ about what kinds of non-evidential grounds can be brought to bear on an underdetermined theory choice—Quine would never allow for a positive effect of the theory on its believers. One surmises that it was the whiff of similarity to James on this matter that motivated Quine to distance himself from the pragmatism so clearly manifest in his view.
>
> (Misak 2013a: 201)

For Misak, James and Quine agree that considerations of simplicity, elegance, and belief-conservativism rightly come into play when evidence is not coercive; but she thinks James adds a further test of whether the potential new belief is "satisfying to me" (Misak 2013a: 66). Misak conjectures that Quine's reticence about identifying as a pragmatist stems from his desire to repudiate just this sort of Jamesean sentimentalism.

Misak is clearly right that James thinks emotion plays an ineliminable role in cognition in *some* way, as we have just seen. There are many other examples we could cite that lend credence to this reading. For instance, in "The Sentiment of Rationality," James says that if our passional nature

> helps those who, as Cicero says, "*vim naturae magis sentiunt*" [feel the force of nature more], it is good and not evil. Pretend what we may, the whole man within us is at work when we *form* our philosophical opinions. Intellect, will, taste, and passion co-operate just as they do in practical affairs.
>
> (WTB: 77, emphases mine)[14]

And he elsewhere likens the scientist who has a knack for dreaming up promising hypotheses to the poet. The "genesis" of scientific hypotheses is

> strictly akin to that of the flashes of poetry and sallies of wit to which the instable brain-paths equally give rise. But whereas the poetry and

wit (like the science of the ancients) are their "own excuse for being," and have to run the gauntlet of no farther test, the "scientific" conceptions must prove their worth by being "verified." This test, however, is the cause of their *preservation*, not that of their production.

(PP: 1232–1233)

An important clarification emerges in this latter passage. As I have elsewhere argued (Klein 2015), sometimes it seems as though James wants to give emotion a central role only in the context of discovery—in particular, in the context of framing hypotheses. He typically avoids claiming that emotions are centrally involved in our final *justification* of a hypothesis.

Thus, James often credits Darwin with distinguishing the causes that *produce* a novel trait (spontaneous variations, in the biological case) from the causes of that trait's being *preserved* or eliminated in a population (natural selection, among other factors). In the *Principles* passage, the point is that we should make a similar distinction when it comes to hypotheses. Emotion and wit are part of the *causes* of a hypothesis; dispassionate testing is how we ultimately choose whether to adopt or reject that hypothesis.

But this suggests we might be able to harmonize the relationship between Quine and James, after all, for their respective webs of belief could simply have been intended as models of different phenomena entirely. Perhaps Quine was modeling *justification*, whereas James was modeling *discovery*. If both men could agree that emotion is irrelevant in the context of justification, but sometimes relevant in the context of discovery, then there is no serious divide here after all.

The case for harmony is perhaps bolstered by some passages in "Epistemology Naturalized." Quine opens that essay by announcing that epistemology "is concerned with the foundations of science" (Quine 1969: 69), which sounds like a concern with scientific justification exclusively. He goes on to describe the kind of epistemological foundations he thinks his naturalistic program can make sense of:

Epistemology, or something like it, simply falls into place as a chapter of psychology and hence of natural science. It studies a natural phenomenon, viz., a physical human subject. This human subject is accorded a certain experimentally controlled input—certain patterns of irradiation in assorted frequencies, for instance—and in the fullness of time the subject delivers as output a description of the three-dimensional external world and its history. The relation between the meager input and the torrential output is a relation that we are prompted to study for somewhat the same reasons that always prompted epistemology; namely, in order to see how evidence relates to theory, and in what ways one's theory of nature transcends any available evidence.

(Quine 1969: 82–3)

What we want to know, according to Quine, is "how evidence *relates* to theory." Evidence can bear all sorts of uninteresting relations to theory, of course. But the specific relation Quine seems to have in mind is *justification*, here.[15] If that's right, then the purpose of making a psychological inquiry into the relationship between the "meager input" of our sensory promptings and the "torrential output" of well-confirmed scientific theory is to shed light specifically on the nature of justification.[16]

For his part, James certainly has more interest in giving an account of scientific discovery (as illustrated by the passage likening hypothesis generation to "flashes of poetry") than does Quine. And what is more, there are passages that suggest that much like Quine, James thinks *justification* should be a comparatively dispassionate undertaking. For instance, in "The Will to Believe," he writes that the "purely judging mind" should "keep weighing reasons *pro et contra* with an indifferent hand"; it is only for the specific "purposes of discovery" that "such indifference is to be less highly recommended." James tells us that in this latter context, "science would be far less advanced than she is if the passionate desires of individuals to get their own faiths confirmed had been kept out of the game" (WTB: 26).

If we take passages like this seriously, James may seem to agree with Quine that justification is a dispassionate affair, and that it is only for the sake of discovery that emotion is permitted to figure in. Let's call this the "weak reading" of James, a reading that stands to help the case for harmony with Quine.

I myself have emphasized the importance of this distinction in James between discovery and justification (in Klein 2015). But what about the first James passage I reproduced involving emotion (P: 34–5)? That passage does not portray emotion as merely helping us *dream* up an ingenious hypothesis, but as pressuring us to *give* up this or that descriptive belief we had antecedently held. That does seem broadly in keeping with Misak's reading of James, according to which emotions are permitted to affect not just hypothesis generation but also *theory choice*.

And that passage is not an aberration. Here are some others:

> Well, of two conceptions equally fit to satisfy the logical demand, that one which awakens the active impulses, or satisfies other æsthetic demands better than the other, will be accounted the more rational conception, and will deservedly prevail.
>
> (WTB: 66)

Notice that when a theory choice is underdetermined, the theory that arouses our "active impulses" or otherwise "satisfies" our "æsthetic demands" (for James, these are demands to feel joy and pleasure, or to avoid sorrow and pain)[17] does not just prevail as a psychological matter of fact. Such a theory "*deservedly* prevail[s]." Much as Misak suggests, James is making a point about how we *ought* to make a choice between competing, underdetermined theories.

And in *Pragmatism*, we also find this passage:

> A new opinion counts as 'true' just in proportion as it gratifies the individual's *desire* to assimilate the novel in his experience to his beliefs in stock. It [the new opinion] must both lean on old truth and grasp new fact; and its success (as I said a moment ago) in doing this, is a matter for the individual's *appreciation*. When old truth grows, then, by new truth's addition, it is for subjective reasons.
>
> (P: 36, emphases mine)

Here James portrays desire as figuring into the web of belief twice over. First, he apparently thinks that novel experiences do not force a change of opinion by themselves. Belief revision sometimes[18] requires the consent of a subject—in some cases, she must first have a *desire* to square her opinions with novel experiences before she will actually change her mind in response to novelty. Second, when she does so respond, what counts as *successful* opinion-accommodation is a matter of personal satisfaction as well. The subject provisionally stops tinkering with her own opinions when she is personally satisfied with the fit between those opinions and her ongoing experiences.

Now these three passages (P: 34–5, 36, and WTB: 66) suggest a stronger reading of James, as contrasted with the weaker reading I myself once developed (Klein 2015). The stronger reading portrays him as holding that emotion is not only useful for hypothesis generation, but that it is sometimes useful for influencing underdetermined belief choices, as well.[19] And the strong reading suggests a more dissonant relationship between Quine and James.

So which is correct: the weak or strong reading of James? Clearly, the weak reading requires simply ignoring several provocative passages, as we have just seen. I now think that cost is too high. But the strong reading also has an interpretive cost if it involves ascribing a philosophically indefensible view to James. So we must now face, head on, the familiar wishful thinking worries that we have already seen Quine articulating.

In order to show that giving emotion a legitimate role in belief-choice is a more defensible epistemological view than it might seem, I will now change tracks and consider a case from the history of medicine. I shall argue that in this case, emotions played something like the fruitful cognitive role James envisioned. In other words, I hope to make the strong reading more palatable by offering a response to the wishful thinking objection. I will return to the relationship between James and Quine in the final section.[20]

3 Emotion and Wishful Thinking

The case I want to consider has to do with research during Quine's lifetime into the etiology of peptic ulcer disease (PUD). The disease is identified with the occurrence of either gastric or duodenal (upper intestinal) ulcers, which can be incredibly debilitating. They can lead to severe internal bleeding,

digestive blockage, and even death. In the late 1990s, about 1 in 300 American seniors were hospitalized for the condition (Feinstein et al. 2010: 1412). At that time, the United States spent almost $6 billion a year in health-care costs alone dealing with the problem, not to mention the untold hours of lost work (Sonnenberg and Everhart 1997).

Until the late '90s, the standard treatment for PUD was acid blockers (Munnangi and Sonnenberg 1997). This is because through at least the middle of that decade, the primary cause of the disease was thought to be excessive gastric acid secretion, with secondary genetic and environmental causal factors (the latter supposedly including stress, poor diet, and smoking; Marshall 2006: 796).

We now know that the most common cause of these ulcers is, in fact, infection with bacteria called *Helicobacter pylori* (*H. pylori*), and by the end of the '90s, the Federal Drug Administration had approved the first antibiotic treatment for PUD. But the story of the discovery that *H. pylori* are pathogenic provides a nice illustration of the beneficial role emotion sometimes plays in scientific inquiry.

The discovery is chiefly attributed to an Australian doctor named Barry Marshall (along with his colleague Robin Warren). In the early 1980s, the prevailing explanations of the etiology of PUD had become particularly entrenched because of the development of a new class of acid-blocking drugs (called H2 receptor antagonists, or H2ra) that temporarily alleviated PUD symptoms. This suggested that excessive gastric acid was indeed the primary cause of the disease. What is more, two blockbuster H2ras were generating, respectively, $1 billion (Tagamet) and $3 billion (Zantac) per year in sales, and thus the medical establishment was particularly loathe to consider alternative explanations at that time (Marshall 2006: 789).

During a gastroenterology rotation in 1981, Marshall had been given a list of patients whose stomach biopsies had been positive for as-yet unidentified spiral bacteria. Marshall did some research and found that these bacteria had rarely been connected with any particular disease, and he subsequently conducted a study of 100 patients to try to determine if they had any common symptoms (Marshall 2006: 790). He found a significant correlation between infection with the bacteria and incidence of ulcers (Marshall 2006: 792).

But correlation is not enough to establish that a bacterial species is a pathogen. The standard way to establish this is to satisfy what are known as Koch's postulates:

1   The bacteria must be present in every case of the disease.
2   The bacteria must be isolated from the host with the disease and grown in pure culture.
3   The specific disease must be reproduced when a pure culture of the bacteria is inoculated into a healthy susceptible host.
4   The bacteria must be recoverable from the experimentally infected host. (Marshall 2006: 794).

By 1983, the chief difficulty was satisfying the third and fourth postulates. Marshall tried to infect four healthy piglets with the bacteria, but the infection did not succeed. What is more, prior literature on the bacteria had noted that cats are almost universally infected, but yet have no associated symptoms (Marshall 2006: 790, 794).

Marshall wanted to study the effect of infection on humans, but he worried about his prospects for passing an ethics board (Marshall 2006: 797). Presumably, his lack of an animal model would have made it difficult to convince such a board to approve infecting healthy humans. And simply giving antibiotics to patients who already had PUD would not be allowed, he feared, because the condition was life threatening and the treatment too experimental (Marshall 2006: 796).

Marshall's now famous response was to self-experiment since, in his words, the "only person in the world at that time who could make an informed consent about the risk of swallowing the *Helicobacter* was me" (Marshall 2006: 797). So in July of 1984, after a preliminary stomach biopsy was negative for the bacteria, Marshall mixed a culture plate of *H. pylori* in a solution of alkaline peptone water (which helps keep bacteria alive). He then swallowed the entire vial himself and waited.

Within days, he began vomiting and came down with halitosis, nausea, and indigestion—all symptoms of PUD. When a stomach biopsy on day ten was positive for *H. pylori*, Marshall considered the experiment a success. "*Helicobacter* was a proven pathogen," he triumphantly writes (Marshall 2006: 797). Fortunately, his symptoms had abated by day 14 when a final biopsy showed that his body had apparently eradicated the *H. pylori* by itself (Marshall 2006: 799).[21]

I want to make several interpretive points about this case. First, in the summer of 1984, as he was considering swallowing *H. pylori*, both James and Quine would have to say that Marshall faced a choice of *belief*. Specifically, he had to choose whether or not to believe his own hypothesis that *H. pylori* cause PUD.

Popular science may counsel that one should merely *entertain* (rather than fully believe) a hypothesis one is testing. But recall that for *both* Quine and James, a belief that *p* is constituted by a disposition to behave as though *p* were true. As we have just seen, Marshall attempted to infect piglets and, eventually, himself with *H. pylori* with the express intent of documenting subsequent PUD symptoms. Surely, that counts as acting as though *H. pylori* cause PUD. If this is right, then for those who accept the characteristically pragmatist James/Quine account of belief, Marshall (in the summer of 1984) counts as genuinely believing that *H. pylori* is a pathogen.[22] What is more, his willingness to swallow a vial of bacteria that, at that time, had not been widely studied reflects stunning confidence in his attending belief that he understood the causal pathways of *H. pylori*.[23]

Second, Marshall was choosing between his own hypothesis and the competing acid-proliferation theory, and that belief choice was underdetermined

by evidence, at the time. There was some limited evidence, in the form of the therapeutic effectiveness of H2ra drugs, that excessive stomach acid was the primary cause of PUD. And there was some limited evidence, in the form of Marshall's own analysis showing a statistically significant correlation between *H. pylori* infection and PUD, of a bacterial pathogen. So like any researcher attempting to confirm or refute a hypothesis that has not yet been substantiated, Marshall had to act before he could have compelling evidence. Indeed, if he had *had* compelling evidence, there would have been no need to undertake the experiment in the first place.

Third, there is no question that emotional considerations factored into Marshall's willingness to pursue this research program (and thus, by Quine and James's lights, into his belief that *H. pylori* cause PUD). Here I quote from Marshall's own account of his work:

> I had not discussed the experiment with [my wife] Adrienne until the evening of the day I swallowed the culture and she had been observing my deteriorating condition without saying too much. While I was sure she would not have approved of the experiment ahead of time, once I began she accepted it was an important milestone. Like me she felt the need to fast track the research. . . . Although I had discussed the proposed self experiment in general terms a few months earlier, and Adrienne had not been radically opposed to it, there was probably another reason for not telling my wife that the time had come. *I could see that the outcome might make a very large difference to our lives.* I had submitted a grant application for funding in 1985, but it was quite likely that my application would fail. In addition, if nothing happened in my experiment, if the bacteria did not take, if [even] gastritis[23] did not develop, then my whole hypothesis could be wrong. At the very least, the disease was far more complicated than I had supposed and it would be extremely hard to convince the skeptics that we had found something important. *If that occurred, my future jobs might be in clinical medicine and I would be off interviewing for placement in a private practice, perhaps in a remote area where my eccentric ulcer theories were less well known.*
>
> *On the other hand, a successful infection with Helicobacter would point towards a career in clinical research, more exciting but likely to be financially insecure. I chose not to raise the issue until the family settled down a little.*
>
> (Marshall 2006: 797–8, emphases added)

Marshall was 30 years old, and he and his wife had four young children to worry about. Particularly for an early-career researcher, choices about what experimental program to pursue (and thus about what hypotheses one should believe) are inevitably tied up with one's desires and fears about one's future, about one's ability to provide for one's family, about one's own prospects for an interesting and fruitful career, and so on.

Again, for pragmatists, the question of whether Marshall (in 1984) should believe that *H. pylori* cause PUD amounts to a question about whether he should *act* as though *H. pylori* are really pathogenic, and so act by pursuing the right kind of experiments. It is clear from this passage that he *hoped* *H. pylori* were pathogenic and that his experiments would tend to confirm this belief. One reason he hoped he was right was that he apparently was more interested in having an "exciting" career in research than a perhaps more financially secure job in "clinical medicine," which he apparently worried would be boring and require him to move his family to an undesirable "remote area" to boot. So one motivation for pursuing this *H. pylori* research involved hopes and fears about his future career.

Marshall had another emotional motivation for hoping his belief about *H. pylori* was correct.

> If I was right, then treatment for ulcer disease would be revolutionized. It would be simple, cheap, and it would be a cure. It seemed to me for the sake of patients this research had to be fast-tracked. The sense of urgency and frustration with the medical community was partly due to disposition and age. However, the primary reason was a practical one. I was driven to get this theory proven quickly to provide curative treatment for the millions of people suffering with ulcers around the world.
>
> (Marshall 2006: 786)

On his telling at least, Marshall felt *sympathy* with suffering patients. He explicitly says he *hoped* his own hypothesis was right because it would suggest a "simple, cheap . . . cure" to help alleviate this worldwide suffering.

Again, in the summer of 1984, his attempts to gather decisive evidence for or against his own belief had failed. He needed an animal model, but pigs proved difficult to infect with this bacteria, and cats, who are almost universally infected, seem not to get ulcers as a result of the bacteria. What in fact pushed Marshall to choose his own etiological explanation of PUD over the standard account was not only, as Misak puts the Quinean point, "considerations of simplicity, elegance, and avoiding massive destruction of our well-grounded beliefs."[24] Such considerations no doubt figured in. But so did a *hope* for a certain kind of career and a *fear* of avoiding another, *empathy* for suffering patients, and a *hope* to find a cure for them.

Indeed, any researcher faced with no prospects for funding a human study or for clearing such a study with an ethics board might be unlikely to run a dangerous experiment on herself unless she had a very serious, emotional commitment to the truth of her own hypothesis. So I suggest that Marshall gives us a clear case of a belief choice that was quite legitimately sensitive to emotional considerations. Without his own emotional investment, he might well have dropped his hypothesis after the piglet experiment failed. And we have seen James making exactly the right point, that without those

"passionate desires" in place, "science would be far less advanced than she is" (WTB: 26).

Quine might reply that if Marshall allowed his own empathy for patients, or his own careerist hopes and fears, to influence his belief, it was simply bad science. *But Barry Marshall was awarded a Nobel Prize for this research in 2005.* Unless philosophers are in the business of criticizing scientific conclusions from some supposedly more secure vantage point (*pace* what Quine himself says; see, e.g., Quine 1960b: 275–6), this seems like a highly dubious move. Nobel prizes are generally reserved for the most secure, and indeed the most dramatic, of scientific discoveries. One could scarcely hope for a stronger normative imprimatur coming from within science itself.

4 Discovery and Justification, Again

So what has gone on here? If the point is that science is sometimes *hard*, not just in a cognitive but also in a personal, emotional sense—surely, Quine can accept that just as well as James, right? It sometimes takes courage and emotional fortitude and a willingness to make personal sacrifice if one is going to pursue a novel or unpopular research program. There should be nothing surprising about this, and one hopes Quine would admit this much.

But then what can we make of Quine's insistence that the "human subject" that naturalized epistemology is to study should be conceived of as an input-output device (Hylton 2007: 81), where the inputs are pure sensory stimulations caused by "patterns of irradiation in assorted frequencies?" Why, in particular, does Quine not include emotions as part of the experiential input of the epistemic subject?

One tempting answer comes from a suggestion I have already made. If Quine sees epistemology—even properly reformed, *naturalized* epistemology— as the study of what *justifies* our best scientific theories, then he may be prepared to accept a role for pragmatic considerations about a theory's simplicity and elegance, which one might plausibly think are conducive to a theory's intelligibility and utility, without being prepared to accept a role for considerations about a theory's emotional appeal, which may not be similarly conducive.[25] On this reading, Quine is tacitly chalking emotional factors in belief-choice up to the discovery side of things.

Bear in mind that Quine thinks every belief choice depends on pragmatic considerations in some way. He does not think we can isolate individual beliefs that are directly responsible to experience. So he is proposing that our web of beliefs is supported, as a corporate body, by evidence from sense perception. We have seen that he thinks the support provided by sense receptors is incomplete—the senses provide only a "meager input" with respect to the "torrential output" of well-confirmed scientific theory. Quinean epistemology thus becomes the study of "ways one's theory of nature transcends any available evidence"[26] so that one can understand precisely

where pragmatic considerations like simplicity and elegance help fortify that "meager" sensory "input." What I am suggesting is that there is no similarly fortifying role for emotion to play, for Quine, because the kind of *support* he is exclusively interested in is that which tends to justify scientific theories. He is not interested in understanding what strategies scientists have followed for *getting* theories confirmed in the first place.

The notion that Quine's is an epistemology of justification exclusively brings us back, finally, to the question of whether we can harmonize his version of the web of belief with James's by construing these as models of different phenomena—perhaps Quine's web models justification, and James's models discovery. I will conclude by arguing that while this might be a good reading of Quine, it is not a good reading of James because the latter cannot accept a sharp division between justification and discovery for the purposes of epistemology.

To see why, consider this passage in James:

> The philosophy of evolution offers us to-day a new criterion to serve as an ethical test between right and wrong. Previous criteria, it says, being subjective, have left us still floundering in variations of opinion and the *status belli*. Here is a criterion which is objective and fixed: That is to be called good which is destined to prevail or survive. But we immediately see that this standard can only remain objective by leaving myself and my conduct out. If what prevails and survives does so by my help, and cannot do so without that help; if something else will prevail in case I alter my conduct—how can I possibly now, conscious of alternative courses of action open before me, either of which I may suppose capable of altering the path of events, decide which course to take by asking what path events will follow? If they follow my direction, evidently my direction cannot wait on them. The only possible manner in which an [ethical] evolutionist can use his standard is the obsequious method of forecasting the course society would take but for him, and then putting an extinguisher on all personal idiosyncrasies of desire and interest, and with bated breath and tiptoe tread following as straight as may be at the tail, and bringing up the rear of everything.
>
> (WTB: 81–2)

This is a discussion of a crudely evolutionist meta-ethical theory, according to which whatever moral principles survive in the community are the best principles. meta-ethical evolutionists claim their account portrays moral principles (for instance, the principle that one ought to maximize pleasure) as objective in the sense that whether such a principle survives in the long run does not depend on any one person's emotional idiosyncrasies. But James argues that even if meta-ethical evolutionism is true, an individual agent should still regard her own emotional constitution as relevant to the moral principles she stands up for, because her own passionate advocacy for some principle may play a causal role in that principle's eventual proliferation in the community.

We have to extend this point to the cognitive domain, as James himself had developed a kind of evolutionary theory of truth. Pragmatists agree that an idea counts as true in virtue of being incorporated into the long-run consensus among an appropriate community of inquirers.[27] James depicted this process as a kind of survival of the fittest ideas (Klein 2013).[28] It seems obvious that just like the passionate moral advocate in the prior paragraph, a researcher's passionate commitment to proving a novel idea today will sometimes help get that idea adopted by the community of inquirers tomorrow. But then a researcher like Barry Marshall was not sinning against the survival of good ideas—not sinning against sound pragmatist epistemology—if his emotions drove his convictions during a trying period of his research. His experiment could have failed, but his emotional conviction would have represented nothing epistemically untoward so long as the broader scientific community was prepared appropriately to vet his results.

It is worth remembering, here, that James had a constructive attitude about proof. The facts may be fixed, but ideas *depicting* those supposed facts are neither true nor false until actual inquirers have produced evidence. Ideas have no valence until an adequate proof is in hand, in other words (P: 97, 108).[29] For James, whether a particular idea is true at a given time is a matter, roughly, of whether the idea is a consensus view at the time in question, and whether the idea would also resist future investigative scrutiny. So there is an independent *fact* of the matter as to whether or not *H. pylori* cause PUD, of course. But James would say that the *belief* that *H. pylori* cause PUD is neither true nor false until it is proved or refuted. And actually proving this particular belief, I have tried to argue, turned out to require a persistent emotional commitment on the part of Barry Marshall.

So here is why James cannot accept a sharp separation between justification and discovery for the purposes of epistemology. Suppose James were to give an epistemological analysis of some idea by appealing only to evidence-like factors[30] from the so-called context of justification, ignoring the historical story of how the idea in question came to be established in the community in the first place. Given his account of truth, that would be like claiming to give an evolutionary explanation of a biological trait by a) showing how the trait is now contributing to the reproductive success of some species that bears it *without also* b) offering any account of either the species' or the trait's evolutionary history. A full explanation in evolutionary biology addresses both a) and b). Similarly, an epistemological explanation cannot be complete by James's lights unless it addresses both evidence-like factors that we think make the idea worth endorsing, today, *and* historical factors that got the idea fixed in the community of inquirers to begin with. In other words, Jamesean epistemology cannot simply set aside questions from the so-called context of discovery.

If this outlook is broadly correct, then it is a serious question for Jamesean epistemology why *this particular* claim about the world (and not some

other claim) became a target of inquiry in the first place. Think of our case study again. If there were no Barry Marshall and no Robin Warren, then possibly, the claim that *H. pylori* cause PUD would not even be a subject of gastroenterological discussion today, because *H. pylori* might then never have been clearly identified at all, let alone connected with PUD. And the emergence of *H. pylori* as a subject of gastroenterological inquiry is a story in which emotional conviction is central.

Thus in the end, I do not think James can be read as offering his web of belief as a model of scientific discovery rather than as a model of justification. For James, scientific inquiry is a process that gets carried out in real, human time; epistemology aims at understanding how that entire process unfolds. Since emotions sometimes play an indispensable role in the course of inquiry, they must be studied by epistemology as James conceives of that enterprise.

So long as we accept what seems undeniable—that emotions like hope, fear, and sympathy may be indispensable to a researcher who is struggling to prove a new and perhaps controversial theory—then if we are *proper* pragmatists, we should not be afraid of an epistemology that countenances wishful thinking.

Notes

1 For accounts of the direct, historical influence on Quine, such as it was, from pragmatists like Peirce and Lewis Lewis, see Godfrey-Smith . . . Godfrey-Smith 2014: 54–8; Sinclair 2012; Isaac 2005; Misak 2013a: 197–9, 2012: 275. Godfrey-Smith is a funny case because he sees Quine as the chief representative of pragmatism in the second half of the twentieth-century, but denies that Quine was faithful to that tradition's original philosophical virtues. One pithy account of Lewis's supposed influence on Quine is worth quoting at length. Donald Davidson writes,

"I do think that C. I. Lewis had a tremendous influence on Quine, but Quine doesn't realize it. The explanation for that is that Quine had no training in philosophy and so when he took Lewis's course in epistemology, he took for granted that this is what everybody knows about epistemology. Quine didn't realize that Lewis was any different from everyone else; pretty soon he worked out that there are some things he didn't agree with Lewis about, like the analytic/synthetic distinction. I don't think Quine would put it this way. As I said, I don't think he realized any of this, but you can find most of Quine's epistemology in C. I. Lewis minus the analytic-synthetic distinction. Epistemology naturalized is very close to the heart of C. I. Lewis. I don't think that Quine knows the extent to which there really is a sequence that starts with Kant and goes through C. I. Lewis and ends with Quine" (quoted at Misak 2013a: 198).

2 Scholars who suggest an affinity between Quine and pragmatism on substance include Creath, Quine, and Carnap 1990: 17–2; Gellner 1979: Chapter 11; Rescher 2012: 294–6; Misak 2013a: Chapter 11; Bernstein 2005; Putnam and Conant 1990: xi; and Rorty 1979: 10.

3 Christopher Hookway suggests that classical pragmatism had only a minimal impact on Quine, and thus that it is a mistake to read him as part of the pragmatist tradition (Hookway 1988: 1–2). Two more recent skeptics include Brown 2006, who offers a brief but critical discussion of some of the lumping literature (also *see* Brown 2012), and Richardson 2013, who dissents from Misak's

portrayal of Quine as a pragmatist. Misak responds in Misak 2013b. In an earlier paper, I tried to distance James from Quine, but allowed that the latter was part of a distinct, Peircean strand in the pragmatist tradition (Klein 2008). I now doubt that Quine is happily viewed as part of a Peircean tradition for reasons that should be clear when the rest of the present essay is read in conjunction with Hookway 2000: Chapters 9–10, 1993: esp. §3.

4 These disagreements are in evidence in my ongoing conversation with Cheryl Misak, who defends a more Peircean form of pragmatism; see Misak 2015, which is a response to Klein 2015. Misak 2013b is in part a response to Klein 2013, which in turn is a response to Misak 2013a.

5 Quine writes, "I am not clear on what it takes to qualify as a pragmatist. I was merely taking the word from Carnap and handing it back: in whatever sense the framework for science is pragmatic, so is the rest of science" (Quine 1991: 272); elsewhere he writes that he had not understood what C. I. Lewis had meant by "pragmatism" (Quine 1981: 23). The epigraph of this chapter reflects Quine's typical disavowal of any direct influence from classical pragmatism. On this topic, also *see* Quine 1985: 38, where he says in high school he had a copy of William James's *Pragmatism* which he read "compulsively and believed and forgot all." Hookway points out that Quine largely abandons talk about "pragmatism" after *From a Logical Point of View* in 1953; see Hookway 1988: 50.

6 For two straightforward treatments of Quine's underdetermination reasoning, see Resnik 2005: 414–15; and Ben-Menahem 2005: 248.

7 For a helpful historical discussion of Quine's evolution particularly on this second point, see Frost-Arnold 2011. Frost-Arnold shows that in his 1934 Carnap lectures, Quine was willing to claim that we could hold putative *empirical* beliefs true come what may, but not until his 1951 "Two Dogmas of Empiricism" was Quine prepared to accept that putative *logical* truths could be revised.

8 Quine's own use of the metaphor traces to a book entitled "Web of Belief" that he co-authored with J. S. Ullian (Quine and Ullian 1970). In personal communication, Ullian writes, "I don't know where the phrase, our title, came from. I don't know of any use of it before ours, but that rules nothing out. Quine and I batted around a lot of ideas and phrases—both of us always seeking the *très bon mot*—whenever we got together to work on the book . . . . Who first used the phrase, or whether it was 'found' somewhere, may be beyond retrieval." The notion of a "web of belief" actually appears in a 1937 work by the anthropologist E. E. Evans-Pritchard: "All their beliefs hang together . . . . In this web of belief every strand depends upon every other strand, and a Zande cannot get out of its meshes because it is the only world he knows. The web is not an external structure in which he is enclosed. It is the texture of his thought and he cannot think that his thought is wrong" (Evans-Pritchard 1937: 194–5). This passage is cited in a somewhat different connection in Baghramian 2004: 123. Ullian tells me that he was not aware of the Evans-Pritchard passage; I cannot find any evidence one way or the other about whether Quine (who had an obvious interest in anthropology) might have read the passage himself, though a later volume Evans-Pritchard edited (Evans-Pritchard 1954) does appear in the bibliography of Quine's *Word and Object* (1960b: 257).

9 This is a point about confirmation, but note that when it comes to *meaning* Quine is not quite as holistic as he is often supposed to be. He held that an *observation sentence* in fact "has an empirical content all its own," and thus that it is only "*once we get beyond observation sentences*" that meaning "ceases in general to have any clear applicability to single sentences" (Quine 1969: 89, emphasis added). For Quine, observation sentences, of course, are those that would elicit the same verdict from any competent speaker in a language community given the same sensory stimulation (Quine 1969: 86–7).

10 To take just one more example, at Quine 1960b: 12–13 the fabric is composed of "all sentences, and indeed everything we ever say about the world," and the "logical truths at least, and no doubt many more commonplace sentences too . . . provide connections" between the other items in the web. Quine quickly adds that when we are considering how to square any *one* sentence with the rest of the web, "some middle-sized scrap of theory" is all that will be relevant— we need not assume that *every* other sentence will need to have its truth-value reexamined.

11 Quine is slippery about whether the web of belief is a collection of opinions a *concrete person* affirms, or a collection of opinions somehow affirmed by the natural sciences at large, or a collection of sentences affirmed by some subset of the natural sciences (like the exact sciences), or something else. For a related criticism about Quine's slippery use of the word "science," see Hacker 2006: 238–9.

12 Gale's reading is not without foundation. James does think that emotion plays an important role in elevating conceptions to full-blooded beliefs. Still, in the passage at issue here, James is clearly discussing already-established beliefs; "desire" comes in on the experience side, as something that we might take account of when we revise those beliefs.

13 This is a well-established interpretive point about Quine. On simplicity and clarity as values scientists use in guiding revisions to their web of belief, see Quine 1960b: 161.

14 For a commentary that lays heavy emphasis on this passage, see O'Connell 1997: 94.

15 There is other evidence that Quine's interest in the relationship between our sensory promptings and our scientific theories is prompted by a concern with something like justification. Quine wrote a letter to Hookway upon reading (Hookway 1988). The letter (which Hilary Putnam published on his blog in 2015) reads in part: "My focus on stimulations reflects a divergence in purpose from Davidson. . . . The philosophical focus of his concern with translation is other minds. My concern is partly that, or meaning, but I am concerned to integrate these matters with "naturalized epistemology" in general, that is, the theory of evidence for science. Hence my starting point is the sensory receptors." He appeals to "sensory receptors" as a way to shed naturalized-epistemological light on "evidence for science," or in other words on what I am loosely calling "justification."

16 At any rate, the relationship between evidence and theory in this oft-quoted passage is typically taken to be a justificatory relation. For instance, after quoting this passage Hylton writes that for Quine, epistemology "is concerned not only with how we can *know* anything about the world, but also with the question how we can say or believe anything—true or false—about the world at all" (Hylton 2007: 81–2). Quine's question is how it is possible to have *knowledge*—beliefs that are at least justified and true—not how we might most fruitfully *search* for knowledge, for Hylton. That is, Quine's epistemology aims at an account of justification, not discovery. Note, by the way, that *explaining justification* is not the same thing as *justifying an explanation*. Quine famously wanted to give up the notion that epistemology aims to justify or make more secure established scientific explanations (Quine 1969: 76). But that is compatible with the idea that he is interested in explaining justification. Finally, the sense of "explain" here will be "genetic" and "psychological," as Hylton puts it (2007: 91–7), but what is getting explained is still *justification*, for Quine.

17 For Kant, "aesthetic" pertains to the study of sense perception in general. He had criticized (at Kant 1781_1787/1965, A21/B35) Baumgarten's narrower use of the word to indicate only the study of taste or artistic judgment. James's own

usage is closer to Baumgarten. James tells us what he takes to be "the broadest genera of æsthetic feeling[:] joy, sorrow, pleasure, [and] pain," at (PP: 194).

18 James is famously voluntaristic about belief, but at WTB: 15, he is quite explicit in saying that not *all* of our opinions are under our direct control: "Can we, by any effort of our will, or by any strength of wish that it were true, believe ourselves well and about when we are roaring with rheumatism in bed, or feel certain that the sum of the two one-dollar bills in our pocket must be a hundred dollars?" James's point is that the most wishful thinker in the world will be powerless to believe that she is healthy when she is really bedridden, for example. So there *are* cases where belief revision *is* forced on us, whether or not we have any desire to accommodate facts, for James.

19 These passages from *Pragmatism* suggest that desire is the key emotion he thinks relevant to cognition, but at WTB: 18, he also accepts a role for "fear and hope, prejudice and passion, imitation and partisanship, the circumpressure of our caste and set."

20 A caveat is in order. Most formulations of the wishful thinking worry are indebted to Clifford (1877), who argued that there are *no* cases where we are licensed to alter belief in light of emotion. But even if one accepts the argument (that I am about to mount) to the effect that are some counter-examples to this sweeping claim, one might still worry that James's epistemology might countenance too much, allowing for wishful thinking even where it clearly ought to be avoided. For instance, if we grant that wishful thinking is permissible in cases like Barry Marshall's, we still might wonder why it is *not* permissible in cases like racist eugenics research. So a full response to the wishful thinking objection would require both an account of the kinds of scenarios where adjusting belief in light of an emotion *is* warranted, and also an account of the kinds of scenarios where it is *not* so warranted. My case study addresses the former issue only. In Klein 2015, I have touched on the *restrictions* James places on allowable influence from emotions on cognition, but I do not have space to do this issue justice here.

21 For a more complete philosophical account of this work than I can offer here, see Thagard 1999.

22 I have argued against the notion that pragmatists can accept that scientific testing involves *entertaining* a belief without fully *believing* it, in Klein 2015: 96–7.

23 Interestingly, he put himself at more risk than he understood at the time. He was prepared to treat himself with the antibiotic tinidazole, which he did after his final biopsy despite by then being symptom-free. But Marshall reports that in a subsequent trial, 23 out of 24 patients treated with tinidazole "merely developed antibiotic-resistant bacteria, which were then rather difficult to eradicate" (Marshall 2006: 798). So had his infection not spontaneously remitted, he would not have had a cure ready.

24 Gastritis is a milder form of gastric irritation than PUD.

25 See above, p. 233.

26 In contrast, James does seem to think that emotions can provide cognitive guidance—after all, we have seen his suggestion that emotions may help some insightful people *"vim naturae magis sentiunt"* [feel the force of nature more] when framing hypotheses.

27 See above, p. 234.

28 Quine advocates disquotationalism in *Word and Object*, considering and rejecting Peirce's pragmatist account of truth (Quine 1960b: 21–2). As Hookway points out, "Peirce is only able to defend such a view . . . by rejecting naturalism, and studying [the nature of truth from] . . . within a purified first philosophy" (Hookway 1988: 69). Quine had better reject anything like a pragmatist account of truth, in other words, on pain of contradicting the strictures of his own naturalized epistemology. Elsewhere I have argued that (like Hookway's Peirce),

James (also) has an anti-naturalistic conception of philosophy as a discipline that must function from a position outside the sciences (Klein 2008). Thus it may be that the ultimate root of James and Quine's disharmony is the question of how philosophy is related to the natural sciences.

29 James says his own web of belief model is meant to explain how "any individual settles into new opinions" (P: 34); the evolutionary story is meant to explain how *communities* of individuals form consensuses over time.

30 Thus like intuitionist mathematicians, pragmatists like James have to reject the law of the excluded middle. Not all claims are either true or false. Claims that have (to date) been neither directly verified nor refuted have some third valence; they are indeterminate.

31 Here I have in mind not just traditional observational evidence, but also cognitive virtues like simplicity and elegance.

References

Baghramian, Maria. 2004. *Relativism*. London: Routledge.

Ben-Menahem, Yemima. 2005. "Black, White and Gray: Quine on Convention." *Synthese*, Vol. 146, No. 3, 245–82.

Bernstein, Richard. 2005. "The Resurgence of Pragmatism." In *Pragmatism: Critical Concepts in Philosophy*, edited by Russell B. Goodman, 54–73. London: Routledge.

Brown, Matthew. 2006. "On What Quine Is [Review of *the Cambridge Companion to Quine*]." *Mind, Culture, and Activity*, Vol. 13, No. 4, 339–43.

———. 2012. "Quine Is Not a (Deweyan) Pragmatist." *Pragmatism in the Philosophy of Science Conference*, University of San Francisco.

Clifford, William Kingdon. 1877. "The Ethics of Belief." *The Contemporary Review*, January, 289–309.

Creath, Richard, Willard van Orman Quine and Rudolf Carnap. 1990. *Dear Carnap, Dear Van: The Quine-Carnap Correspondence and Related Work*, edited by Richard Creath. Berkeley: University of California Press.

Evans-Pritchard, Edward E. 1937. *Witchcraft, Oracles and Magic Among the Azande*. Oxford: The Clarendon Press.

———. 1954. *The Institutions of Primitive Society*. Oxford: Wiley-Blackwell.

Feinstein, Lynda B., Robert C. Holman, Krista L. Christensen, Claudia A. Steiner and David L. Swerdlow. 2010. "Trends in Hospitalizations for Peptic Ulcer Disease, United States, 1998–2005." *Emerging Infectious Diseases*, Vol. 16, No. 9, 1410–1418.

Føllesdal, Dagfinn. 2001. *The Philosophy of Quine: General, Reviews, and Analytic/Synthetic. Vol. 1 of 5*. New York: Garland.

Frost-Arnold, Greg. 2011. "Quine's Evolution From 'Carnap's Disciple' to the Author of 'Two Dogmas.'" *HOPOS: The Journal of the International Society for the History of Philosophy of Science*, Vol. 1, No. 2, 291–316.

Gale, Richard M. 1999. *The Divided Self of William James*. Cambridge: Cambridge University Press.

Gellner, Ernest. 1979. *Spectacles & Predicaments: Essays in Social Theory*. Cambridge: Cambridge University Press.

Godfrey-Smith, Peter. 2014. "Quine and Pragmatism." In *A Companion to W. V. O. Quine*, edited by Gilbert Harman and Ernest Lepore, 54–68. Malden: Wiley-Blackwell.

Hacker, Peter M. S. 2006. "Passing by the Naturalistic Turn: On Quine's Cul-De-Sac." *Philosophy*, Vol. 81, No. 2, 231–53.

Hookway, Christopher. 1988. *Quine: Language, Experience and Reality*. Cambridge, MA: Polity Press.

———. 1993. "Mimicking Foundationalism: On Sentiment and Self-Control." *European Journal of Philosophy*, Vol. 1, No. 2, 156–74.

———. 2000. *Truth, Rationality, and Pragmatism: Themes From Peirce*. Oxford: Clarendon Press.

Hylton, Peter. 2007. *Quine*. New York: Routledge.

Isaac, Joel. 2005. "W. V. Quine and the Origins of Analytic Philosophy in the United States." *Modern Intellectual History*, Vol. 2, No. 2, 205–34.

James, William. 1978. *EP. Essays in Philosophy*, edited by Frederick H. Burkhardt, Fredson Bowers and Ignas K. Skrupskelis. Cambridge, MA: Harvard University Press.

———. 1890/1981. *PP. The Principles of Psychology*, edited by Frederick H. Burkhardt, Fredson Bowers and Ignas K. Skrupskelis. Cambridge, MA: Harvard University Press.

———. 1907/1975. *Pragmatism*, edited by Fredson Bowers and Ignas K. Skrupskelis. Cambridge, MA: Harvard University Press.

———. 1897/1979. *WTB. The Will to Believe, and Other Essays in Popular Philosophy*, edited by Frederick H. Burkhardt, Fredson Bowers and Ignas K. Skrupskelis. Cambridge, MA: Harvard University Press.

Kant, Immanuel. 1781–1787/1965. *Critique of Pure Reason*. New York: St. Martin's Press.

Klein, Alexander. 2008. "*Divide Et Impera!* William James's Pragmatist Tradition in the Philosophy of Science." *Philosophical Topics*, Vol. 36, No. 1, 129–66.

———. 2013. "Who Is in the Community of Inquiry?" *Transactions of the Charles S. Peirce Society*, Vol. 49, No. 3, 413–23.

———. 2015. "Science, Religion, and 'the Will to Believe.'" *HOPOS: The Journal for the International Society for the History of Philosophy of Science*, Vol. 5, No. 1, 72–117.

Marshall, Barry. 2006. "Helicobacter Connections." *ChemMedChem*, Vol. 1, No. 8, 783–802.

Misak, Cheryl J. 2012. "Donald Davidson's Place in the History of Pragmatism." *Cognitio: Revista de Filosofia*, Vol. 1, No. 2, 271–8.

———. 2013a. *The American Pragmatists*. Oxford: Oxford University Press.

———. 2013b. "Reply to Four Instructive Critics." *Transactions of the Charles S. Peirce Society* Vol. 49, No. 3, 434–42.

———. 2015. "Klein on James on the Will to Believe." *HOPOS: The Journal of the International Society for the History of Philosophy of Science*, Vol. 5, No. 1, 118–28.

Munnangi, Sivakumar, and Amnon Sonnenberg. 1997. "Time Trends of Physician Visits and Treatment Patterns of Peptic Ulcer Disease in the United States." *Archives of Internal Medicine*, Vol. 157, No.13, 1489–1494.

O'Connell, Robert J. 1997. *William James on the Courage to Believe*. 2nd edition. New York: Fordham University Press.

Putnam, Hilary and James Conant. 1990. *Realism With a Human Face*. Cambridge, MA: Harvard University Press.

Quine, Willard van Orman. 1951. "Two Dogmas of Empiricism." *Philosophical Review*, Vol. 60, No. 1, 20–43.

——. 1960a. "Carnap and Logical Truth." *Synthese*, Vol. 12, No. 4, 350–74.

——. 1960b. *Word and Object*. Cambridge, MA: MIT Press.

——. 1969. "Epistemology Naturalized." In *Ontological Relativity and Other Essays*, 69–90. New York: Columbia University Press.

——. 1981. "The Pragmatists' Place in Empiricism." In *Pragmatism, Its Sources and Prospects*, edited by Robert J. Mulvaney and Philip M. Zeltner, 21–39. Columbia: University of South Carolina Press.

——. 1985. *The Time of My Life: An Autobiography*. Cambridge, MA: MIT Press.

——. 1987. *Quiddities: An Intermittently Philosophical Dictionary*. Cambridge: Belknap Press.

——. 1991. "Two Dogmas in Retrospect." *Canadian Journal of Philosophy*, Vol. 2, No. 3, 265–74.

Quine, Willard van Orman and J. S. Ullian. 1970. *The Web of Belief*. New York: Random House.

Reichenbach, Hans. 1938. *Experience and Prediction: An Analysis of the Foundations and the Structure of Knowledge*. Chicago: University of Chicago Press.

Rescher, Nicholas. 2012. *Pragmatism: The Restoration of Its Scientific Roots*. New Brunswick: Transaction Publishers.

Resnik, Michael. 2005. "Quine and the Web of Belief." In *The Oxford Handbook of Philosophy of Mathematics and Logic*, edited by Stewart Shapiro, 412–36. Oxford: Oxford University Press.

Richardson, Alan. 2013. "What Good Is a (Indeed, This) History of Pragmatism?" *Transactions of the Charles S. Peirce Society: A Quarterly Journal in American Philosophy*, Vol. 49, No. 3, 405–12.

Rorty, Richard. 1979. *Philosophy and the Mirror of Nature*. Princeton: Princeton University Press.

Sinclair, Robert. 2012. "Quine and Conceptual Pragmatism." *Transactions of the Charles S. Peirce Society*, Vol. 48, No. 3, 335–55.

Sonnenberg, A. and James E. Everhart. 1997. "Health Impact of Peptic Ulcer in the United States." *American Journal of Gastroenterology*, Vol. 92, No. 4, 614–20.

Thagard, Paul. 1999. *How Scientists Explain Disease*. Princeton: Princeton University Press.

White, Morton. 1990. "Pragmatism and the Revolt Against Formalism: Revising Some Doctrines of William James." *Transactions of the Charles S. Peirce Society*, Vol. 26, No. 1, 1–17.