

# 3

## Why be Hanged for Even a Lamb?

Nancy Cartwright

### 1. The Setting

Having recently returned from Churchland-land, I have in mind to defend van Fraassen's claims in *The Scientific Image* from a well-known criticism by Paul Churchland. In *The Scientific Image*, as we know, van Fraassen maintains that the *proper epistemic attitude* to theory is to believe in what the theory tells us about what is observable. He explains that he means observable to people without the aid of instruments if they were in the right place at the right time. And he maintains that what is and what is not observable in this sense is a matter of objective fact, although we may need to use theory in order to figure out what the objective facts about observability are.

This last was seen as a kind of salvation by contemporary empiricists. Under the influence of Logical Positivism, we had adopted the strategy of talking only about our representations, which are clearly accessible to us (in some, perhaps not well formulated, but still straightforward sense of 'accessible') in a way in which the 'real' world that lies behind the representations is not accessible. Logical Positivists do not say, for example, that the operation of natural laws produces the facts that we can fairly readily tell to obtain by looking (or other ways of sensing). Rather we say, 'The law statements of our best theory imply statements couched in observational language.'

Nancy Cartwright / 33

Under the influence of Hanson, Feyerabend, Kuhn, and others, we became convinced that there is no theory/observation distinction. Every concept of our language depends on theory for its meaning and the conditions of its application. So an empiricist-style commitment to believe only in the observable seemed not to make sense.

Van Fraassen has been heralded for ‘unwinding the linguistic turn’: he boldly talked about the world and distinctions in it. This gave us a seemingly sensible way to formulate this particular empiricist-style commitment—so long as we were prepared to give up the empiricist reservations that led us in the first place to eschew talk about things not ‘accessible’ to us. Van Fraassen, I think, was indeed prepared to give up these reservations. He did after all insist that we should take theoretical claims about what is unobservable literally; and he definitely did not forbid us to believe in these claims. What he told us was that belief in them is not the ‘proper’ scientific attitude.

Churchland challenged van Fraassen on a number of points. Among other things, he denied the existence of the distinction van Fraassen asserted between what is and what is not objectively observable in the sense van Fraassen adumbrated. He also challenged the epistemic significance of such a distinction. This is the challenge I shall consider here.

Here in my words is Churchland’s objection. Suppose, for the sake of argument, that there is a distinction between what is and what is not observable. Van Fraassen tells us that the proper epistemic attitude is to believe in what theory tells us about what is observable. But what is epistemically so good about what is observable? Perhaps there is epistemic justification for believing in what is observed, but after that, what is so special about the *observable*? It is an extension beyond what is observed and there seems no good epistemic reason to stop there.

## 2. A Pause. (Why Believe in What We Observe?)

Let us pause to consider what might justify us in believing in what we observe. Is Churchland correct? Will none of these reasons extend to a justification for believing in the consequences predicted by our ‘accepted’ theory about what is observable?

Consider certainty. That is an epistemic virtue. But we are all schooled in the long twentieth-century retreat in search of certainty: we begin by

### 34 / Why be Hanged for Even a Lamb?

supposing that what is observable are middle-size physical objects and end up by supposing that only sense data are observable. Then the final blow—even pain reports may not be entirely reliable. After this, few of us would take claims about the observed to be certain. To deploy the virtue of certainty, van Fraassen would need beyond this to provide reason to think that what our accepted theory tells us about what is observable is certain. And he would have to do that for a theory that he himself maintains we are not justified in believing in.

Another possibility involves meaningfulness. Meaning is given in observation; what is not like what has been observed cannot be meaningfully spoken of, let alone sensibly believed in. Or we might argue that observation tells us about certain *kinds* of phenomena. What is observable is always, by definition, of the same kind as what we have observed and Occam's razor tells us not to believe in more kinds than we need. Neither of these work; nor I think would van Fraassen advocate them. He admits that the meaning of observation terms is not 'given in experience' but depends on the role of the term in a larger conceptual scheme. He also admits that we need theoretical terms to get the predictions we want about what is observable.

I myself am prepared to defend a special epistemic status for what we observe, for two, coupled reasons. The first involves the internal logic of the term 'observes': it follows from  $x$  is *observed* that  $x$  *exists*. There are of course a lot of predicates with this characteristic. Perhaps the most famous use of this argument form is Descartes's, *I think; therefore I exist*. There are notorious concerns about the truth of the premise—perhaps there is thought but are we sure there is an 'I' having the thought; but the argument is valid.

Other examples that matter to scientific inference include  $x$  *causes*  $a$  and  $x$  *explains*  $a$ . The first of these definitely implies that  $x$  exists. As for the second, we are usually considering an inference to  $x$  is *true* not  $x$  *exists*. Whether the inference holds depends on what we take explanation to mean, and even then the answer is not always clear. If it means *from*  $x$ ,  $a$  can be *deduced*, the conclusion does not follow. But it seems that many think it does follow if we add in just the right additional theoretical virtues. For instance, . . . and  $x$  is *the simplest theory from which*  $a$  can be *deduced* or . . . and  $x$  is *the most unifying theory from which*  $a$  can be *deduced*. Or perhaps the claim is just the weaker one that *probably*  $x$  is *true* follows. Another famous case of the use of this kind of internal logic for scientific inference is Ian Hacking's dictum, *If you can spray them, they exist*.

Nancy Cartwright / 35

I should note that what is and is not a part of what I called the ‘internal logic’ of a predicate can depend heavily on empirical facts. For instance, *I dream of x* does not imply *x exists*. But it might have, had the world been different; it might well have been that at night we could not entertain any images that we had not observed during the day. Similarly, one might endorse simplicity or unifying power as a guide to truth in the world as it is without thinking that it had to be that way.

Having the right kind of internal logic isn’t enough, however, for a feature to be of use in scientific inference. Most physical relations imply existence: *John kicked the football* implies both that the football and John exist; *My sister is standing in front of me in the queue* implies I have a sister; and so on. But these are of little use in inference if the premises are shaky. *My sister killed Roger Ackroyd* implies that I have a sister but it may not be much help in establishing that fact. Similarly, *gravity waves carry the gravitational influence* can only assure us that gravity waves exist if we have confidence that they are what carry gravitational influence.

What then about our stock examples for scientific inference: *x explains a*, *x causes a*, *we can spray x*, and finally the one of central concern here, *x is observed*. Do these features have the second requisite feature for scientific inference—that we can in relevant cases be confident of the premise?

The advantage of *x explains a* in the sense *a can be deduced from x* is that we can be fairly certain of the premise. The problem is that this interpretation of ‘explain’ does not have the right internal logic. Suppose we could add in just the right theoretical virtues to ensure the internal logic. Then our confidence depends on how easy it is to be sure that the theory in question does indeed have these virtues.

What about my favourite, *x causes y*? Consider Michael Scriven’s example of the fault in the bridge. We become convinced that it caused the collapse because we know an awful lot about what makes bridges collapse, and we have eliminated all the other plausible alternatives. I have argued that this is a standard procedure in many fields, such as physics and engineering, where we have accumulated a great deal of antecedent causal knowledge.

Hacking’s discussion of spraying electrons points to exactly the same two characteristics that I have stressed for a feature that will be useful in scientific inference. First, almost all of his statements of the thesis made are to the effect that scientists who believe they are spraying electrons are thereby committed to them. That is a claim about the internal logic of *spraying*. He also argues that we can defend that we are spraying electrons by reference to a great many

### 36 / Why be Hanged for Even a Lamb?

low-level, highly confirmed uncontroversial practical facts about electrons. That is, we have good reason to accept the premise, even though we may be in doubt about all extant theories of the electron.

Finally we come to our topic here: observability. With all this groundwork laid, it is easy to describe the situation. Does *x is observed* have the right internal logic? Yes. Do we often have good reason to think that we have indeed genuinely observed something? Yes. Our reasons can never make us certain and they will inevitably rely on bits of theory but very often our reasons are very good.

Our topic, however, is not *what has been observed* but rather *what is observable*. I have argued that we can often be justified in believing that what we observe exists. Can this justification extend to believing in what our accepted theory tells us about the observable? I do not see any way that it can do so. We are not, after all, on van Fraassen's account, justified in believing the theory is true. So we cannot help ourselves to the view that the theory is true to go from the premise *x is a claim about something observable* to the conclusion *x is true*. Moreover, if the argument itself goes through equally well if we change the initial phrase to *x is a claim about something unobservable . . .*. So Churchland's objection definitely holds if my way of defending belief about what we observe is in focus.

### 3. Return to the Main Theme

I have just outlined what I take to be epistemically special about what we observe. Van Fraassen, we should notice, never tells us what is so good, epistemically, about either what is observed or what is observable. He does not opt for my defence of the observable nor for any one of the others mentioned. Instead van Fraassen relies on our desire to be empiricists: as he has said, 'I am trying to be an empiricist.' It is thus difficult to take him on frontally. The usual philosophical approach would be to argue that the epistemic virtues adduced for the observable are either 1) not epistemic virtues or 2) not true of the observable or 3) equally true of many things unobservable.

When your opponent does not commit himself, all that is left is to speculate. I take it then that Churchland's bet is that whatever virtues van Fraassen might adduce, either 1) or 2) or 3) is true of them. Churchland's view is that once we have gone beyond the observed, there is no reason to stop at the observable. If theory is allowed to tell us about things that are unobserved and

Nancy Cartwright / 37

not observable, it can equally tell us about things that are unobserved but observable in van Fraassen's sense. Any epistemic reason that allows us to use theory to go beyond the observed will equally allow us to go all the way to a host of theoretical claims as well.

In reply van Fraassen urges that there is no epistemic principle that requires that we should as well be hanged for a sheep as a lamb. Churchland objects. Lambs and sheep are after all distinguishable. But there is, so far as Churchland can see, no epistemic distinction between a theory's claims about the observable and many well-established theoretical claims about the unobservable. It is true that sticking to what the theory says about the observable commits one, as van Fraassen's aphorism suggests, to fewer beliefs. But the difference between what we should believe in and what not, à la van Fraassen, seems both arbitrary and odd. We might as well opt for believing every fourth thought that pops into our heads, or everything that Karl Popper endorses, or . . . .

#### 4. The Ingredients of the Defence

I propose to end-run Churchland's objection by supposing that what is special about the observable is not an *epistemic* virtue at all. I shall defend the claim that the proper epistemic attitude is an epistemic attitude—belief—and it is proper in the sense that we are reasonable, indeed possibly rational (if we take seriously the economist's sense of 'rational'), to adopt this attitude. But what makes it reasonable is not that the observable has some special epistemic virtue. Rather, it depends on the fact that we are creatures bound in a world of sensation and, unlike other facts about us, this is not a matter of choice.

My account is based on three things:

- a) an implication that follows from taking seriously van Fraassen's statement that no epistemic rules dictate that one might as well be hung for a sheep as a lamb;
- b) a discussion with van Fraassen not long after the appearance of *The Scientific Image* in which he defended his view;
- c) van Fraassen's own emphasis on the importance of choosing our beliefs.

I may of course be making up an argument that is not there in van Fraassen's thought at all. Perhaps I make too much of the aphorism or of a long-ago and

38 / **Why be Hanged for Even a Lamb?**

probably ill-remembered conversation that, at any rate, van Fraassen did not commit to publication. Nevertheless I think that the position I shall describe is not in any way at odds with what van Fraassen has published, and it is, I believe, a position that answers Churchland's pressing challenge.

a) Think about the aphorism of the sheep and the lamb, but think about it the other way round. The implication is clear that we will at any rate be hung for the lamb. In our case that means hung for believing in the theory's claims about the observable. I propose to take that implication seriously as one that van Fraassen intends. And I myself am prepared to defend it. If our standard is *what is observed*, then belief in the unobserved but observable claims of a theory is hangable, and no more nor less so than belief in the theory's claims about what is unobservable. That is: a good theory's claims about what is observable have no special epistemic virtues over its claims about the unobservable. If epistemic warrant is required, we shall be hanged for both.

b) What other kind of warrant is there? Van Fraassen and I talked long ago about microbes. What I recall he said to me is something like this: What is it that in the end you care about? Not the invisible microbe but rather the stomach-ache you might feel. So long as you've got it right about that—and all the other sensations that the microbe might produce—what more can you really mind about?

I take it that the idea is the longstanding empiricist thesis that nothing outside our own thoughts and emotions can affect us except via our senses. The effect on us of everything from the outside world is mediated entirely via our senses—nothing from outside can affect us in any other way.

There is another blatant fact about our perceptions and sensations to note as well. Our perceptions and sensations are imposed on us; we are affected by them willy-nilly, whether we choose to be or not. We can act to enhance them or diminish them or control them, but so long as we have them at all, they affect us. This gives us a primitive justification for attempting to control them: self-protection.

This is not, however, a justification that works equally for control of unobservables. This primitive justification extends only to unobservables in so far as they affect our perceptions of our sensations; and if we have already accounted for these, we have no justification on this particular ground left over for seeking to control the 'outside' world.

Nancy Cartwright / 39

c) We shall not need to consider the importance of van Fraassen's concern for choice until we have looked at the argument itself.

## 5. The Argument

We have a justification for attempting to control what we will in fact observe. In order to control what we will observe we need to be able to predict what we would observe under a variety of courses of action that we might take. How shall we do this? We can elect to let our favourite theory be our guide. We shall use our theory to form our beliefs about what would in fact be observed under any possible courses of action we might take.

This clearly takes us very far beyond belief in what we do in fact observe. Perhaps it does not take us all the way to belief in everything the theory tells us about what is observable, but only those things that are the endpoints of some possible course of action. But the possible courses of action are highly varied; and there seems to be no natural category into which fall exactly the claims of the theory that we will need about the observable. So perhaps we might as well believe in them all.

If we wish to be sticklers, however, I shall have to modify van Fraassen's position: the proper epistemic attitude to a theory we accept is to believe in those claims it makes about observables that we could observe under some possible course of action. We should note that this is a difference, and it may be a difference that matters to some. Simon Saunders, for instance, wants to believe in what theory tells him about the macroscopic make-up of very very distant parts of the galaxy. It seems likely that my argument will not provide him with a defence for holding these beliefs. Similarly, Peter Lipton points out that beliefs in past unobserved observables will also be unsupported by this primitive self-interest defence.

## 6. Some Things to Note

Van Fraassen never tells us that the proper epistemic attitude to a well-confirmed theory is to believe in what it tells us about what is observable. His claim is more conditional: to accept a theory is to believe in what it tells us about what is observable. What van Fraassen in fact says makes good sense

#### 40 / Why be Hanged for Even a Lamb?

on my reading. To accept a theory is to decide to use *it* to make all those predictions about what we might observe that will help us chart our actions. The justification for using the theory in this way is not an epistemic one. Belief in what the theory says about what is observable is the *proper* epistemic attitude to the theory we accept because that is just the point of accepting the theory. We do not otherwise have to accept or reject any theory at all. We are not compelled by principles of rationality to have any epistemic attitudes at all to a theory.

As strict empiricists we may feel that we are not normally justified in holding beliefs about anything beyond what we observe—at least not epistemically justified. We do, however, have a primitive non-epistemic justification for trying to control what we will experience. That gives us a special justification for forming beliefs about what we would experience under various courses of action. And I mean here ‘belief’ in a full-blooded sense, as a guide to action not just as some attitude or state of mind: we believe; we vote with our feet. Given that a particular theory is our preferred method for forming these beliefs, we are thus justified in believing that theory’s dictates about what is observable. But nowhere along the line do we have an epistemic justification for this epistemic attitude.

The proper epistemic attitude *to a theory we have accepted* is to believe in what it says about the observable. What I have added to van Fraassen’s words is an account of ‘proper’: the attitude is proper, or justified, because we have a primitive reason to try to control what we will experience.

It is worth noting that this justification does not apply to belief in what we have in fact observed. If we wish to believe in what (we think) we have observed, we will need a different justification, for instance, than the one I offered above.

### 7. The Importance of Choice

When I discussed these ideas with Paul Churchland recently, he had his usual kind of sensible, direct-to-the-logic-of-the-argument reply. Churchland *cares about* not only his experiences, but about a myriad of facts about the outside world, and he cares about them in themselves, above and beyond their effect on his experiences. He *wants* to form beliefs (hopefully true beliefs) about them independent of how they affect what he will observe. ‘For instance,’ he says, ‘I

Nancy Cartwright / 41

care about whether my wife loves me, not just about whether I have all the experiences as if she did.’

We need only couple this with some justification for these concerns to be able to repeat the argument I have given above, but this time in defence of the dictates of our accepted theory about the topics of these concerns. And surely such justifications cannot be hard to come by.

There is a difference, however, between these concerns about external matters of fact beyond the effect they have on our perceptions and sensations and our concerns about our perceptions and sensations. We live in a world of perception and sensation willy-nilly; they affect us independently of how we construct our lives, who we choose to be or how we choose to live. That is not true in the same way about other matters, once their effect on our experiences has been taken into account. A physicist may care deeply about the structure of space–time; he can be justified in forming beliefs about it by his drive to know and a realization that he would never continue with his arduous research if he did not believe. But it is not forced on him to be affected by these concerns beyond their effect on his experiences. They are a matter of choice, of how he wills to construct his life.

Van Fraassen, we should note, does not tell us we should *not* believe in what theory says about the unobservable. He merely says that that is not the *proper*, or, I take it, ‘justified’ attitude. But there is no suggestion that an attitude that is not justified is wrong or is to be avoided or is opposed to rationality. Failing to have a justification for an attitude is in no way the same as having a justification for rejecting that attitude. There is vast space for choice. And choice is a good thing. What is important (at least if we wish not to be self-deceived) is not to conflate the beliefs and concerns we choose by ourselves with those that we are supported in.

This kind of approach is explicit in van Fraassen’s recent work. But it is also there in *The Scientific Image*. We are not, for instance, as I already remarked, told not to believe in the theory itself. We are just not to suppose that we have a justification for doing so.

We see this again in the discussions of theory choice in *The Scientific Image*. Perhaps we are forbidden by some principles of rationality from believing in a theory that has been refuted by observation (though Lakatos taught us that even this is not a good rule to use). Beyond that, there is not much guidance. There is the usual list of features people resort to for theory choice beyond simply insisting that the theory not be already refuted: richness of content,

## 42 / Why be Hanged for Even a Lamb?

precision of predictions, novelty of predictions, simplicity, elegance, and so on. But *The Scientific Image* teaches that these are not epistemic virtues but pragmatic ones. Pragmatic virtues are always relative to our ends, intentions and desires. Once we have passed beyond controlling our sensations, these are matters that we choose. In the domain of theory choice, we cannot fall back on epistemic principles or on the primitive justification of self-protection. We must decide for ourselves. So, too, with Churchland's choice of concerns beyond his own experiences. It is his choice, not something that he should or must do.

## 8. An Objection

Stuart Hampshire has queried whether my emphasis on our perceptions conflicts with van Fraassen's views about sense data. Hampshire himself maintains that both sense data and Hume's sense impressions are items of a philosophical theory, and of a bad theory at that. I agree. More importantly, so, it seems, does van Fraassen. This is what he himself has said about sense data, and it is entirely consistent with everything in *The Scientific Image*.

I do not see any conflict at all. To deny that we have sense data is not to deny that we perceive and that we sense: that we have stomach aches, or that we hear Pat's laughter as she walks into the room or feel the warmth of her hand. These sights and sounds and feelings impinge on us. They are part of the common-sense world that van Fraassen endorses. To deny—or remain agnostic about—sense data is to refrain from accepting an account or theory or interpretation of these.

I must admit, however, that van Fraassen's observables are much closer to Hume's sense impressions that I think they should be. When I open my eyes I observe around me all sorts of causings. I see the cat lapping up the milk, Emily pulling her Dad up from a chair, and the local bully causing a child to cry by his teasing her. Van Fraassen counts none of these as observable.

Of course on many accounts causings are not things. So we confront here as elsewhere a familiar problem in discussing van Fraassen: he talks only about *things* and never about the properties we observe them to have or what we observe them to do. This makes it even harder I think to see how to find an epistemic defence for his advice to believe in what the theory says about observable things, independently of whether those claims are about observable features of the observable things.

Nancy Cartwright / 43

At any rate this is not really relevant to Hampshire's worries. If van Fraassen does think of sensations as somewhat like Hume's impressions but unlike sense data, it does not matter to my argument on his behalf. What matters to my defence is that our sensations (whatever they are) impinge on us; and this defence is open to van Fraassen so long as he does not think otherwise on this point.

## 9. The Argument in Sum

We have a special primitive justification of self-defence for forming beliefs about what is observable: these beliefs help us control the experiences and perceptions that are thrust upon us.

We choose, say, theory T to form these beliefs.

So we have a special primitive justification for self-defence for believing what T says about what is observable.

We may also choose to have other concerns, for example

- Does my wife love me?
- What is the structure of space–time?

We may also choose T to form beliefs about the subjects of these concerns. There is nothing rationally (or otherwise, usually) forbidding us from doing so. But for these beliefs we do not have the same primitive justification of self-defence.

The fact of the matter about the subject of these concerns (for example, the fact of the matter about the structure of space–time or about whether our wife loves us) does not thrust itself upon us above and beyond its effects on our perceptions and sensations. We may *be concerned about* whether our wife loves us or about the structure of space–time and we may *want* to form beliefs about these. But—given we have already taken account of our sensations and perceptions—these concerns are not justified by simple self-defence. It may seem right or natural to choose them given who and what we are, or perhaps almost impossible not to. But, no matter how central they are to our lives as human beings, these concerns are about facts that do not impose themselves on us.

44 / **Why be Hanged for Even a Lamb?**

10. Conclusion

Is—or was—this van Fraassen’s view? Was our conversation about microbes different from the way I remember it, or, if remembered correctly, just a passing fancy of van Fraassen’s? My contention is that if it was not his view, then it—or something very like it—should have been. I have presented a picture of Churchland’s objection that I am prepared to defend. There is no epistemic justification for believing in what a theory says about what is observable that will not end up allowing us to justify many things it says about the unobservable.

It is no help to say, for example, that we are moving as minimally as possible beyond what is actually observed, with no new categories, no new kinds of things. For our justification for believing in what we observe has nothing to do with the theory that predicts it. We have either my story, or more standard empiricist stories about direct access, to serve as justification there. But where does the epistemic justification come from to believe in anything theory tells us, even in what theory tells us about what is in fact observed?

The full-blooded realist, who believes that we have epistemic warrant for the theory itself, can offer a ‘trickle-down’ justification. Van Fraassen cannot do this, nor, surely, does he wish to. And, as I have indicated, I would certainly argue that there are no good grounds for a ‘trickle-across’ epistemic justification from observed data to the theory’s predictions about what is observable, even if the data support the theory. We can go on; there are other tactics. But I believe we will find them all wanting. If there is justification to be had, it will be some non-epistemic justification. If the one I have laid out is not sound, something else must be found—but something like mine that offers non-epistemic reasons for van Fraassen’s preferred epistemic attitude.

We should not overlook the fact that the special version of empiricism that van Fraassen offers is a very odd one. Why should one want to maintain it? Well, if you are a non-realist—you do not take belief in theory to be justified—the very best thing would be to have your cake and eat it too: withhold belief in the theory that you eschew but still be able to do everything the realist can do.

This is the strategy of one of Arthur Fine’s often quoted arguments: you tell me what you think you can do by believing the theory is true that the non-realist cannot do? To my mind the most compelling answer one can give is that, if the theory is true, one can reliably use it to make predictions about the outcomes of our possible courses of action. But then, Fine points out,

Nancy Cartwright / 45

the non-realist can simply believe that the theory makes reliable predictions about the outcomes of actions without making the extra step to the truth of the theory. Surely the non-realist's beliefs must be at least as well justified as the realist's, because they are weaker.

This kind of argument is not available to van Fraassen. For he is not trying to talk the realist into disbelief. He is positively endorsing a specific set of beliefs. And we should still wonder what the motive could be. But surely the motive of Fine's realist is the compelling one: these are just the kind of beliefs that can guide our actions. Van Fraassen's special version of empiricism does not seem so odd if we see it in this light, as an attempt to justify the kinds of beliefs we need in order to act. For then the task is to look for justification for having beliefs about the observable outcomes of our actions—what right or reason do we have for forming such beliefs? Following a suggestion of van Fraassen himself, I have proposed that the reason is the primitive reason of self-protection. We will experience our experiences willy-nilly, and that gives us every reason to form beliefs to control them.

