
The Problem with Case Studies

Joseph C. Pitt

Abstract

After Kuhn cast doubt on the usefulness of the abstract positivist models by appealing to the history of science, philosophers have felt compelled to use historical case studies in their analyses. However, it is not clear what exactly appeals to case studies accomplish. On the one hand, if the case is selected because it exemplifies the philosophical point being articulated, it is not clear that the philosophical claims have been supported, because the historical data have been manipulated to fit the point. On the other hand, if one starts with a case study, it is not clear where to go from there—for it is unreasonable to generalise from one case or even two or three. If historical studies are to be useful for philosophical purposes, they must be extended historical analyses which contend with the life span of a scientific problematic. It is not enough to isolate a single experiment or look at the activity of a lab under one director. Just as philosophical problems are not problems about the single case, historical issues must be seen in context.

After Kuhn cast doubt on the usefulness of the abstract positivist models by appealing to the history of science, many philosophers have felt compelled to use historical case studies in their analyses. Kuhn however did not tell us how to do this. Further, it is not clear exactly what appeals to case studies accomplish. On the one hand, if the case is selected because it exemplifies the philosophical point being articulated, then it is not clear that the philosophical claims have been supported, because it could be argued that the historical data most probably have been manipulated to fit the point. On the other hand, if one starts with a case study, it is not clear where to go from there—for it is unreasonable to generalise from one case or even two or three.

Even very good case studies do no philosophical work. Rather we must turn to extended historical studies that contend with the life span of a scientific problematic. It is not enough to isolate a single experiment or to look at the activity of a lab under one director. One needs to place the case in the context of a problematic and to explain a problem-

atic in terms of its origins and its fate (Pitt 1992). But even then it is not clear what philosophical work is being done. This may be, at best, history of ideas. The point here is simple: just as philosophical problems are not problems about the single case, historical issues are particular and must be seen in context. But seeing a historical issue in context does not by itself suggest any particular philosophical point. It may be that the problem here lies in our understanding, or lack of it, of what constitutes a context. The importance of understanding the appeal to historical contexts is to show how doing history in context limits the possible range of philosophical ideas and explanations. By way of example, I will consider the philosophical question of what constitutes a scientific observation. I will argue that a serviceable philosophical, i.e., universal, account of scientific observation is not possible. What is allowed as an observation varies in time, place and with respect to changing criteria influenced by technological innovation.

If I am right, this view provides a serious basis for rejecting Kuhnian paradigms. Problematics have histories, but that does not mean they are stable over time. Quite the contrary, the reason why it is important to appeal to problematics is that they change even as they serve to restrict research to certain topics. As philosophers we seek universals, but the only universal regarding science is change. That seems to be a fact. But, it might be responded, as philosophers we are also interested in the normative—our job is to attempt to show what we ought to mean by *x* or *y*. And I say that while that is true, in our normative guise we also cannot ignore what is in fact the case.

The issue of not begging the question looms large. Let us start with a big question, which is continually begged—Just *what* constitutes a case study? We select the historical episodes we do for a variety of reasons with few, if any, operative guiding principles. I propose that we *can* develop a set of criteria for selecting a case study, but there are several costs. The problems involve the selection criteria. For example, if we want to start with the science and see where that leads us, then, without begging the question, we have to find the science. Identifying the science in question in a non-whiggish fashion is a delicate matter. We simply cannot assume that what we call physics today, is what the scientists practising physics in 1830 would call physics.

My way out of this apparent dead end is to proceed by identifying a problematic instead of looking for a science. A problematic consists of a set of intellectual concerns that motivate an investigator or a group of investigators to pursue the investigations they do. Where such a group of investigators can be identified we have a social fact as a starting place. For an example of such a group, I suggest Copernicus, Tycho, Kepler, Galileo, Clavius, and Scheiner. Their interests did not correspond 1 to 1, but each had to consider the others as relevant to their research interests either singularly or in sets.

Now for the cost: problematics have their own history, they have starting points and end points, and in between they change, mutate, sometimes they evaporate, sometimes they metamorphise into something new. Further, in the course of working within the problematic, what emerges may not be what was expected. Finally, although this may seem obvious, to identify a problematic one must position it historically. This is to put the problematic in context, which is difficult, for in any historical setting there are many contexts, and we must avoid begging the question by selecting a context which conveniently supports our concerns. In short, if we start with case studies, we are assaulted on all sides by issues of question begging. Let us look more deeply at the notion of context.

What is it that philosophers expect to accomplish by appealing to history and historical contexts? To answer this question, I will approach the issue of the goal of contextualisation by first dealing with the notion of a context.

Let us begin by reviewing the evils contextualisation is supposed to avoid:

- (1) Whig History—a term coined by Herbert Butterfield (1931), it refers to the attempt to impose current categories of analysis on historical events.
- (2) Universalism—a corollary to (1); the idea that certain features of science are constant over time.
- (3) Modernism—the insistence that the most important developments of any epoch are science (conceived in contemporary terms) related.

- (4) Abstraction—the reification of key features of a period.
- (5) Internalism—the process of examining the work of a person by appeal only to his or her notes and texts without consideration of any social or external factors—fall prey to (3) or to (1), since to really know is already to understand the context in which an author writes.

If the contextualist historian successfully avoids (1) – (5), then he or she is left in the position of arbitrarily identifying people in places and can only hope that the preponderance of the evidence and correlations account for what *x* said about *y*. The laudable intent of the contextualist is to show that great figures do not emerge from a vacuum. The problem, however, is that there is no obvious principle of selection which guides the identification of people who or events that allegedly transform the vacuum into a social context. The result can be that the figures highlighted can be minor or obscure; likewise for social factors. Without a well-articulated and defensible principle of selection, the attempt to construct a context is at best arbitrary; at worst it is self-serving. Why certain figures are identified is also not clear, since all the objections used above with respect to *x* apply equally well to these problems. The contextualist project, seen in this light, is hopelessly flawed.

As we have seen, if we pay too close attention to the standard justification for contextualisation, the program collapses. And yet there is something positive to be said in favour of each of (1) – (5). It is just that taken together nothing much is left. Have we taken a wrong turn somewhere?

It might appear that we have been led to our unhappy conclusion by concentrating on only one aspect of the contextualisation of history, i.e., the individuals. But the collapse of contextualism does not occur only when individuals are the subjects of discussion. For example, an anti-Whig historian will also justifiably reject talk of ‘science’ in the 16th century, there being natural philosophy for the study of the natural world. Thus the reification of concepts also seems to be a problem.

So, what is the point of contextualisation? Minimally a context is supposed to provide an *explanatory framework* for specific historical developments, i.e., it sets the stage on which the historian’s explanations will be seen to make sense when offered. The crucial mistake made by

advocates of historical contextualisation is to give the impression that there is only one appropriate context that satisfies the explanatory-allowing role. The writing of history is necessarily selective. However, the shift from individuals or activities such as history or art, to context is no less selective or arbitrary, for (with apologies to Nelson Goodman) contexts are where you find them. For example, consider the contexts in which Galileo could be said to have operated. (1) The Renaissance, (2) The Scientific Revolution, (3) The Medicean Court, (4) The Archimedean tradition, (5) The Euclidean tradition, (6) The Aristotelian tradition, (7) The Platonic tradition, (8) The Medieval tradition, (9) The battle between the Vatican and the Italian secular states for political control of the Italian peninsula, (10) The Age of Exploration, (11) The Age of Elizabeth, (12) The 16th Century, (13) The 17th Century, (14) A personal struggle to financially support his family, (15) The personal politics of the struggle between theologians and natural philosophers, (16) The Counter Reformation. At this point we haven't even begun to explore whether we should approach Galileo as an engineer, a physicist, an astronomer, an instrument maker, an amateur musician, a father, a philosopher, a theologian, a good catholic or a pain in the pope's nose. Given all this, just how is one supposed to pick the relevant explanatory framework?

However, picking the relevant explanatory framework may not be as difficult as it appears. The trick lies in figuring out what it is about the person or the event you want to explain. Even so, there is something more problematic than determining which framework to pick, that is the problem of determining what constitutes an appropriate explanatory framework or frameworks for a topic, i.e., what constitutes an explanation in these contexts, or to cut to the chase, what constitutes a historical explanation *simpliciter*.

To ask this question assumes, incorrectly, that there is one kind of historical explanation that fits all sizes. We actually have two questions here—first, there is the problem of selecting an appropriate framework. Second, once a framework has been selected, we still need to be able to sort out what kinds of explanations are appropriate and satisfactory and which ones are not. Here I will concentrate only on one part of the

second question by trying to answer a slightly different question, namely 'What do we want from a historical explanation?'

Rephrasing, it reads 'Why do we seek historical explanations', which sounds a lot like 'Why do philosophers of science turn to history?'

What makes for an adequate explanation is the sense that our account of why things happened in the past hangs together with what we know preceded and followed the event in question. That is, we seek to construct a *coherent story*.

Appearances to the contrary notwithstanding, this need not be anachronistic. Nothing in the notion of a coherent story suggests that we necessarily must see what happened in the past in a direct, causal line with the future, which is our present. A relevant set of contexts can be identified in terms of their explanatory value, i.e., the coherence they contribute to the story accounting for why what happened happened. To the extent that the failure to include certain factors can be shown to be relevant to understanding what happened after the events in question, we can argue for expanding the set of contexts. So, a historical context is a set of factors which provide an explanatory framework for an event, a person's actions or work, or a social trend, etc. The adequacy of the context is a function of its ability not only to account for the event in question, but also for its prior and subsequent history.

All that having been said, we still cannot account for the philosopher of science's appeal to history. The job of explaining why the past was the past is the historian's job. The philosopher who looks to the past as revelatory of the present is doing bad history. However, there is a philosophical job to be done with respect to the past. One of the features that needs uncovering when we try to understand an individual's actions is the set of assumptions with which he or she was working. In particular, we need to know what were the expectations at play at the time in order to assess the quality of the work being done. Uncovering assumptions and exploring texts for hints to expectations are jobs philosophers are good at. But in so doing, we learn little about what is relevant for today. So, at the moment, I cannot find the cash value of case studies for the philosopher of science who starts with history.

Instead of starting with historical cases selected for the way they are assumed to illuminate contemporary philosophical issues, or for providing the data for building a philosophical theory, let us start from the side of theoretical questions. The kind of question I have in mind is ‘what is a scientific explanation’ or ‘what is a scientific observation’—when we look to history to answer such questions, we stumble in many ways over assumptions that at first seem innocent and which eventually prove fatal. For example, when one asks what is a scientific observation, it seems that we are asking about the ‘observation’ part, assuming that we know what ‘scientific’ means. But even if we have a good solid understanding of what ‘scientific’ means (which we don’t) we can’t simply assume that we can apply that understanding backwards in time—to do so is to engage in Whig historiography which we all now know is a no-no.

Now, let’s assume that we not only know what ‘scientific’ means, but also what ‘observation’ means and what ‘scientific observation’ means—now each of these expressions has a history and their meanings have changed over time. To look to Galileo’s telescopic observations to enlighten us as to the meaning of ‘scientific observation’ today is to run rough shod over good historiography and to assume that philosophical analysis has some sort of atemporal, a priori, intellectual legitimacy and that as philosophers we can appropriate history to our own ends, confirming our assumptions. What it would mean for Galileo to make a scientific observation of the moons of Jupiter? ‘Scientific’ is not a term in play at the time. To claim that his observations were scientific is read backwards from the present into history, which is unjustified. Second, it is not clear that at the beginning of the 17th century there was a formal understanding of what was meant by an observation as opposed to any number of other similar activities such as seeing, perceiving, a sighting, etc.

I think we can agree on why certain highly constrained settings in a lab can yield observations. But what about the pictures of the surface of Io being sent back from the current Galileo space probe? There are a number of different kinds of steps in between the taking of a measurement of Io and our seeing the result here on earth. Transmitting devices need to be aligned, involving computers and computer programs, there is the encoding of the measurements and then the sending and the

assumption that nothing happens to it while it makes its way from the orbit of Jupiter to Earth. Then there is the reception of the data, more computers and programs to transform the encoded data into a picture and Lo! An observation! To accept those pictures today as observations requires that we have expanded our understanding of what constitutes an observation from the simple bare eye seeing of nature and our report of that seeing to something considerably more complicated and sophisticated. The extent to which we have accepted the fact that remote instruments make observations is a far cry from simple seeing.

I propose that not just observation, but all of the concepts we use to discuss science are in constant flux. Peter Galison makes that case with respect to the meaning of 'experiment' in the 20th century in *Image and Logic*. What constitutes an explanation, evidence, data, observation, etc., all change over time and usually in response to some technological innovation. That being the case—i.e., that the meanings of these concepts are in constant flux, it would seem impossible that we could learn anything about our present concerns from the past. And so once again, the question remains as to what we can gather from case studies.

So where does this leave us? We don't know what a case study is—if we shift to a problematic we open up a can of worms—problems are embedded in historical contexts, but selecting the right context without begging the question isn't obvious. On the other hand, if we assume that concepts associated with philosophical analyses of science have some sort of atemporality we violate legitimate historiographical concerns.

Does this mean that Kuhn's wake-up call to philosophers to pay attention to history was misguided? I think not. However, as philosophers we need to lower our sights or perhaps we need to raise them and consider more than only abstract philosophical criteria. Further, we need to develop a more robust sense of the sloppiness of our conceptual history. We seek precision, definitional clarity, analytic sophistication. These are good—but there is more to understanding—it requires depth and flexibility and a sense of the give and take and contingency found in history.

References

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