

Notes Toward an Analysis of Conceptual Change

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Abstract

This paper analyses conceptual change. A rejection of pure experience has prompted philosophers of science to adopt a certain perspective from which to view changes of belief. Popper, Kuhn, and others have analysed conceptual change in terms of problems or anomalies, that is, in terms of contingent reasoning about issues posed in the context of an inherited web of belief. This paper explores a more general analysis of conceptual change in dialogue with these philosophers of science. Because changes of belief are not all changes in scientific belief, we seek to unpack conceptual change in terms of dilemmas, as opposed to anomalies or problems. For a start, the notion of a dilemma has to be broader than that of an anomaly since it purports to apply to conceptual change as a whole, not just the transition from one era of normal science to another. In addition, we should detach the notion of a dilemma from the objectivism of Popper's world-3 problems.

How should we analyse change in beliefs, concepts, ideas, or thought? Two stylised views stand as extreme answers to this question. On the one hand, logical empiricists might argue that people test their theoretical beliefs against pure observations, modifying any beliefs that are in conflict with these observations; so, they might conclude, we can analyse conceptual change by showing certain observations falsified old beliefs while providing support for new ones. On the other hand, idealists might argue that people pursue consistency, modifying beliefs that are in conflict with one another; so, they might conclude, we can analyse conceptual change by showing old beliefs contained two contradictory propositions that the new ones reconcile in an appropriate way. Most philosophers of science over the last 30 years or so have attempted to analyse scientific change not in terms of experiences or inconsistencies, but in terms of problems, as with Sir Karl Popper, or anomalies, as with Thomas Kuhn.¹

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The emergence of notions such as problem and anomaly reflects a trend in philosophy away from atomistic empiricism and toward meaning holism and the related notion of the web of belief.² Once philosophers accept that no experience can prove conclusively the truth of any given proposition, they generally conclude that what we accept as true depends on background theories, albeit background theories hardened by convention. Once they conclude that what we accept as true depends on background theories, moreover, they are then prompted either to dismiss rational thought altogether by suggesting that background theories determine what we take to be true, or, more plausibly, to equate rational thought with attempts to improve background theories by reflecting on the difficulties we find in them and in their relationship to our experience. Hence, contemporary philosophers of science often pose the question of how we should analyse scientific change as one of how to analyse individual reasoning about issues that arise against the background of an inherited body of knowledge. I want to explore conceptual change more generally through a consideration of the implications of meaning holism and the web of belief.

Any attempt to bring an analysis of conceptual change into line with that of scientific change is likely to face objections to the implicit equation of all conceptual change with the ‘reasonable’ process that characterises science. In fact, however, the very developments in the philosophy and history of science to which I have just referred also have contributed to a broader questioning of the model of scientific change as an inherently ‘reasonable’ process. This rethinking of science clearly suggests that we should operate not with a distinction between scientific and non-scientific change, but with one between ‘reasonable’ and ‘unreasonable’ change. Although a complete analysis of conceptual change would cover both sides of the latter distinction, we might begin by offering an analysis of ‘reasonable’ change, while also noting that ‘unreasonable’ change is that motivated by rogue pro-attitudes and so best analysed in terms akin to hot irrationalities and even weakness of the will.³

Although the following analysis concerns only ‘reasonable’ conceptual change, this does not mean that it applies only to cases in which people clearly strove over a period of time to devise a response to an anomaly, problem, or dilemma. People often change their beliefs in a flash – the resolution of an issue, the answer to a question, comes to them in a moment. When this happens they do not seem to arrive at their new beliefs as a result of a process of deliberation. This does not mean, however, that ‘reasonable’ forms of explanation are inappropriate to such cases. We can never follow the actual psychological process by which individuals make any conceptual change. Whenever we unpack such a psychological process, we do so by describing a series of psychological states – beliefs, pro-attitudes, and the like. No matter how many psychological states we thus identify, however, we always come up against the moment when one gives way to another. We always come up against the questions of why and how an initial psychological state gave rise to another. Any attempt to analyse conceptual change solely in terms of psychological states necessarily runs aground on the rock of the nature of the connections between such states. ‘Reasonable’ forms of explanation come into their own in providing us with a means of avoiding this rock. They enable us to traverse those moments when people actually change their beliefs since the concept of ‘reasonableness’ provides us with an account of how one psychological state can arise out of another.⁴

An analysis of 'reasonable' conceptual change might begin from the philosophy of science as it has developed during the broader philosophical shift from atomistic empiricism to meaning holism and the web of belief. Meaning holists argue that a concept, proposition, or belief gains meaning only within the context of a larger language or web of belief.⁵ One implication of meaning holism thus appears to be that we should reject the possibility of pure experience or pure reason as a basis for belief formation. We cannot attach meaning to experiences, or begin to reason, save in the context of an existing web of beliefs, which thus influences the content of our experiences and reasoning. Meaning holism, in implying that there are neither pure observations nor self-supporting beliefs, also suggests that no single observation or logical principle provides a sufficient analysis of conceptual change. Certainly people want their webs of belief to coincide with their experience of reality, but their experience of reality is theory-laden, so an observation alone cannot require them to change their beliefs. Hence, we cannot analyse changes of belief solely in terms of observations or experiences. Certainly, too, people seek to make their webs of belief consistent, but their beliefs refer to an external world, so the consistency they seek is consistency in terms of their understanding of the world. Thus, we cannot analyse changes of belief solely by reference to the inner logic of a tradition or web of beliefs. Because webs of belief are networks of interconnected concepts mapping onto reality at various points, we can analyse conceptual change only by exploring the multiple ways in which a new understanding interacts with an old web of beliefs. Sometimes we will have to show how a new experience promoted a new view of old theories. At other times we will have to show how a new theory promoted a new interpretation of old experiences. No single starting point underlies all changes of belief. Rather, beliefs develop in a fluctuating process with all sorts of beliefs pushing and pulling one another in all sorts of ways.

Meaning holism encourages us to locate conceptual change at the moment when agents modify an inherited web of beliefs in response to anomalies, problems, or dilemmas. To locate conceptual change at this point is to suggest that it is a more or less ubiquitous feature of human life. People are always confronting slightly novel circumstances that require them to apply anew the beliefs they inherited. Moreover, because the beliefs that people inherit cannot fix the criteria of their own application, when people confront novel circumstances, they have to develop their inheritance in what is thus a continual process of conceptual change. Whenever people confront a new situation, they must extend their inherited concepts to encompass it. Even if a tradition, paradigm, or discourse appears to tell people how they should do so, it actually can provide them at most with a guide to what they might do, not a rule deciding what they must do. A tradition or paradigm can point people in a given direction, but the only way they have of checking whether they have been true to it is by asking whether they and their fellow adherents are content with what they eventually decide to do. Thus, change occurs even on those occasions when people think they are adhering strictly to a tradition they regard as sacrosanct.

The ubiquity of change also reflects the fact that people always think about, and perhaps try to improve upon, their inheritance. Every time anyone reflects on the concepts they inherit, they are liable to become aware of difficulties with those concepts, and their concern to resolve these difficulties typically will then prompt them to modify the concepts. Even if people think they are striving only to

understand correctly a tradition they regard as sacrosanct, their effort to do so will involve their exercising their reason, which, in turn, will entail their developing the tradition. No doubt some traditions, such as one based on a single divine revelation, encourage their adherents to describe the results of their reasoning as elucidations, not innovations. No doubt, moreover, some traditions, such as modern science, encourage their adherents actively to seek innovations. In both cases, however, innovation necessarily occurs if only as a result of the humble effort to understand what has gone before.

Conceptual change does not occur as a series of random fluctuations totally unrelated to human agency, nor is it exclusively the result of the self-conscious attempts of a few thinkers to devise a more coherent set of beliefs; rather, it occurs because we are agents who reflect on the traditions we inherit in the light of our own experiences and thereby alter these traditions in accord with our own reasoning.

Meaning holism provides us with the impetus to search for a general analysis of ubiquitous conceptual change along the path already trodden by philosophers of science. Nonetheless, we have to modify the theories of Kuhn and Popper if we are to make them serve us beyond the confines of science – we have to rethink ‘anomalies’ and ‘problems’ as ‘dilemmas’. Kuhn in particular is led by his focus on science to take for granted things such as the predominantly empirical nature of beliefs, a high level of agreement about background theories, and a shared commitment to advancing knowledge through experimentation. Even if these assumptions are appropriate when one explores the sociology of conceptual change in science, they have no place in an analysis of conceptual change more generally. Not everyone reasons in the ways that characterise the scientific community, so we cannot explain all changes in all webs of belief in the ways we might explain the changing content of scientific knowledge. Much of our analysis of the concept of a dilemma, therefore, will consist of an emphasis on the need to ensure that it remains broader than the alternatives deployed by philosophers of science.

A dilemma is a new belief which merely by virtue of the fact that one accepts it as true poses a question of one’s existing beliefs. It is important to recognise here that we cannot identify dilemmas exclusively with facts. Philosophers of science are inclined to discuss anomalies, problems, and the like as if they are typically factual beliefs generated by experiments.⁶ Even if they reasonably can do so in so far as they restrict their attention to the case of science, once we look beyond science we can no longer do so. A fact can constitute a dilemma: for example, the discovery by Victorian geologists that many rocks were far too old to fit into the cosmology that theologians had derived from the Bible constituted a dilemma for Christians who believed Genesis required the world to be about 5000 years old. However, theories that are quite distant from observations also can constitute dilemmas: for example, the theory of evolution proved an even greater stumbling-block than geology for many Victorian Christians. Even moral beliefs with little observational content can act as dilemmas: for example, Victorian Christians often reacted strongly against talk of hell-fire and eternal damnation precisely because they believed these theological doctrines were immoral.⁷ So, a new understanding can constitute a dilemma wherever it might lie on the spectrum that passes from exemplary perceptions with little theoretical content to complex theoretical constructions with only a distant basis in perceptions. What turns an understanding into a

dilemma is the authority it possesses for the person for whom it constitutes a dilemma, and it acquires this authority simply because that person accepts it as true. When people accept an understanding as true, they come to believe it, so they incorporate it into their existing webs of belief, and they thereby necessarily extend or otherwise modify their beliefs.

Whenever we come to believe something new, we confront the dilemma of how we are going to incorporate it within our existing web of beliefs. Here too we have a contrast between the concept of a dilemma and similar concepts found in the philosophy of science. The stability of science – the fact that most changes in scientific beliefs extend existing theories rather than overturning them – encourages philosophers of science, notably Kuhn, to focus on the rare anomalies that lead scientists to renounce a number of entrenched theories. Anomalies are the rare pieces of factual evidence or theoretical innovations that conflict with the then established paradigm. In Kuhn's view, then, anomalies are responsible only for the occasional, revolutionary transformation: most conceptual change occurs when scientists extend a ruling paradigm. He says, 'resistance guarantees that scientists will not be lightly distracted and that the anomalies that lead to paradigm change will penetrate existing knowledge to the core'.⁸ Dilemmas, in contrast, arise all the time, for they include not only the rare anomalies that prompt scientists to make drastic changes to their webs of belief, but also the concerns that prompt scientists to extend prevailing theories during a period of normal science, and even the trivial puzzles that lead all of us to adopt new beliefs all the time in our everyday existence.

An analysis of dilemmas should distinguish them not only from Kuhn's anomalies, but also from the more objectivist problems invoked by Popper. Although philosophers of science, including Kuhn, sometimes appear to ascribe to anomalies or problems an existence independent of individuals, we can often unpack their concepts as inter-subjective ones; we can say that the strong consensus among scientists means an anomaly or problem in science usually afflicts a number of scientists who share the beliefs that give it its character.⁹ Popper, in contrast, explicitly rejects any such inter-subjective account of problems in favour of objectivism. He claims that problems exist independently of the beliefs of every individual subject. He writes, for example, that problems 'need not have their conscious counterpart' and even 'where they have their conscious counterpart, the conscious problem need not coincide with the objective problem.'¹⁰ Popper reaches his objectivist view of problems because he regards them as difficulties in theories that themselves exist independently of every individual subject in World-three.

According to Popper, World-one is the physical world of particles, waves, and the like; World-two is the mental one of states of consciousness, including beliefs, emotions, and the like; and World-three consists of the products of consciousness, such as theoretical systems, critical arguments, and problems. World-three consists of objective thoughts that possess an autonomous existence quite apart from the actual beliefs of individuals: it contains the intended and unintended products of individual minds in so far as they persist independently of all minds in things such as biological organs, language, and books.

The weakness of Popper's position appears in the notion that the theories, arguments, and problems published in journals and books are mere marks on pages apart from when particular individuals attach meanings to them. As marks on

pages, moreover, they are meaningless, and so do not constitute theories, arguments, and problems at all. A theory is a theory only if it is held by someone. What is more, because there are no theories in a Popperian World-three, there cannot be objective problems afflicting them. Because any theory must be a subjective or intersubjective one held by particular individuals, problems must be subjective or intersubjective dilemmas.

Imagine that Popper reconstructed an objective World-three problem-situation as X, where X makes it rational for scientists to believe Y, so that Popper could explain a scientist believing Y by saying it was the rational thing to do in the situation X. Imagine now, however, that the scientist's subjective understanding of the problem-situation in World-two was Z, not X. Surely we cannot accept Popper's analysis that the scientist believed Y because the problem-situation was X? Surely we must analyse the relevant conceptual change in terms of the scientist coming to believe Y in the context of his or her subjective understanding Z?

Let us turn now from the dilemmas that inspire changes of belief to the nature of the changes they inspire. The way people respond to any given dilemma reflects both the character of the dilemma and the content of their existing webs of belief. Consider the influence of the character of a dilemma on the changes people make in response to it. When confronted with a new understanding, people must either reject it or develop their existing beliefs to accommodate it. If they reject it, their beliefs will remain unchanged. If they develop their beliefs to accommodate it, they must do so in a way that makes room for it, so the modifications they make to their beliefs must reflect its character. To face a dilemma is to ask what an authoritative understanding says about how the world is, and, of course, to ask a question is always to adopt a perspective from which to look for an answer. Every dilemma thus points us to ways in which we might resolve it. For example, several Victorians resolved the conflict they perceived between faith and the theory of evolution by arguing that God is immanent in the evolutionary process – God worked through natural processes in the world, rather than intervening miraculously from beyond. They reconciled the theory of evolution with a belief in God by presenting the evolutionary process as itself a manifestation of God's will. Their new web of beliefs included a religious rendition of the new understanding that constituted a dilemma for them.

Consider now the influence of people's existing webs of belief on the nature of the changes they make in response to a dilemma. If people are to accommodate a new understanding, they must hook it on to aspects of their existing beliefs, where the content of their existing beliefs makes certain hooks available to them. To find a home for a new belief among their existing ones, they have to connect the two, and the connections they can make depend on the nature of their existing beliefs. When we react to a dilemma, we do so by drawing on themes already present in our beliefs, and this means that these themes necessarily influence the way in which our beliefs change. For example, the pantheistic beliefs associated with the romantics provided some Victorians with a hook on which to hang a theory of evolution. They moved from a pantheistic faith in nature as a mode of God's being by way of the theory of evolution to an immanentist faith according to which God worked his will through natural processes in the world. They reconciled the theory of evolution with faith in God by hooking the former on to pantheistic themes in their existing beliefs. Their new web of beliefs incorporated an evolutionary rendition of themes drawn from their old one.

After people find hooks in their existing webs of belief on which to hang the understanding constitutive of a dilemma, they have to go on to modify several more of their existing beliefs. To see why this is so, we need to remember that meaning holism implies that our beliefs map onto reality only as webs. Thus, a change in any one belief requires compensating and corresponding changes to be made to other, related beliefs. A new understanding affects a web of beliefs somewhat as a stone does a pool of water into which it falls – a disturbance occurs at the place where the stone enters the water, and from there ripples spread out, gradually fading away as one recedes from the centre of the disturbance. Once again, the additional changes people thus make to their beliefs reflect both the character of the dilemma and the content of their existing beliefs. Each adjustment they make enriches the themes that bring the new understanding into a coherent relationship with their existing beliefs.

The process of conceptual change is an open-ended one in that people resolve dilemmas by creatively using their current webs of belief rather than by passively following them. Here passively to follow a web of beliefs would be to draw out consequences already contained within it: the existing web of beliefs would fix the way in which someone resolved the dilemma. The notion that people might simply apply their beliefs appears to be undermined by one rendition of Wittgenstein's account of rule-following – no rule, no web of beliefs, can define the criteria of its own application.¹¹ So, any existing web of beliefs provides hints as to how one might proceed, but it is always possible for someone to neglect any given hint. Whenever people use a web of beliefs to respond to a dilemma, they draw on its resources as a guide to how to modify their beliefs to accommodate the understanding constitutive of the dilemma. Nonetheless, people's existing beliefs will suggest several ways of resolving any dilemma. No doubt some changes of belief seem to entail nothing more than the passive following of an existing web of beliefs. However, these cases are merely those when we happen to accept the adequacy of the way in which the people concerned used their beliefs to resolve the relevant dilemma. Whenever we think people applied their beliefs in the way they should have done, we will be inclined to say that they were true to their beliefs. We will say such things, however, simply because we judge it is so, not because their application of their old beliefs corresponds to criteria fixed by those beliefs.

It is perhaps worth pausing here to note that because webs of belief do not circumscribe the ways in which people might develop them in response to a dilemma, we cannot predict with any certainty how people will respond to a dilemma. Even if we have knowledge of their existing beliefs and the dilemma, all we can offer is an informed conjecture.¹² The implication of this inability to predict is, of course, that there is something amiss in too straightforward an assimilation of the explanation of conceptual changes to the model of causation associated with the natural sciences.

We have found that a dilemma is a new belief, where any new belief, merely by virtue of being adopted, poses a question of the web of beliefs into which it is inserted. A dilemma thus arises whenever people's reflections in relation to their experiences lead them to adopt a new understanding as authoritative. Although our theories always enter into our experiences, our experiences still influence the beliefs we eventually come to hold since they pose questions for the beliefs we inherit. The notion of a dilemma thus provides one way of acknowledging the importance of the natural and social worlds as influences upon our concepts.

Attempts to relate our concepts to experience raise the question of whether or not we can privilege one type of experience, or understanding thereof, as the sole or primary source of conceptual change. Do economic, political, or some other set of experiences – or do epistemological, semiotic, or some other set of understandings – have a privileged role as a source of conceptual change? The generality of the notion of a dilemma certainly suggests that we might ask whether we can reduce dilemmas to a specific type of experience or understanding – whether that be economic experiences, semiotic theories, or the quest for power and office.¹³

If we could reduce dilemmas to a single type of understanding, then all of our beliefs would take their validity from that basic type of understanding. In contrast, meaning holism implies that our beliefs resemble a spherical web, not a pyramid. Our beliefs do not follow from one another in a chain secured at a single point to a particular type of theory-laden experience. Rather, our beliefs all draw support from one another as they map onto reality as a complex whole. Again, no one type of experience can fix the beliefs we come to hold because we play an active role in constructing our experiences in terms of our current webs of belief, and these webs of belief incorporate beliefs about things other than any one type of experience.

All our experiences and all our beliefs link up with one another – they form a seamless web. Although we can categorise a specific set of experiences and beliefs as such and such an area of life, the categories we deploy do not demarcate isolated, self-sufficient areas of life. Moreover, because all areas of life thus depend on others, we cannot identify any area of life as authoritative over all others. Most individuals, for example, have experiences of work and of God, and these experiences are saturated with their existing economic and religious beliefs, which, in turn, interpenetrate with the rest of their webs of belief. This means, first, that their understanding of work and of faith interact with each other because they exist as parts of a single worldview, and, secondly, that we cannot reduce either type of understanding to the other since their interaction is reciprocal. A religious belief can influence one's political views: a spiritual belief in the importance of detaching oneself from the world might lead someone to political quietism. Equally, however, an understanding associated with work can influence one's religious views: a belief that a denomination favours an economic group might lead someone to worship elsewhere. The different areas of life are neither independent of one another nor reducible to one another.

Conclusion

Human scientists are still inclined to treat conceptual change as if it were a product either of autonomous human agency or of the internal logic of a tradition or discourse. Recent philosophy of science, in contrast, encourages us to analyse such change in terms of individual reasoning within the context of an inherited web of beliefs. Conceptual change arises, in other words, as people respond to anomalies or problems.

However, although recent philosophy of science, tied as it is to a broad holism, encourages us to analyse conceptual change in some such fashion, the more detailed content it ascribes to the notions of an anomaly or problem cannot always be adopted wholesale to an analysis of such change in general. In particular, we need to adopt a notion such as dilemma that, firstly, avoids the objectivism

associated with Popper's notion of a problem, and, secondly, covers not only the dramatic shifts that Kuhn explores in terms of anomalies but also the more mundane everyday changes of normal science and everyday life. A dilemma here consists of any new belief, which, merely by virtue of our entertaining it, forces a reconsideration, and so development, of our existing web of beliefs. Although such dilemmas can arise from novel theory-laden experiences, they can also arise from theories with little direct observational content. Even when they do arise from experiences, moreover, we cannot identify any one type of experience as uniquely responsible for them.

Notes

1. See, respectively, K. Popper, *Objective Knowledge: An Evolutionary Approach* (Oxford: Clarendon Press, 1972); and T. Kuhn, *The Structure of Scientific Revolutions* (Chicago: University of Chicago Press, 1970). Also, see L. Laudan, *Progress and Its Problems* (Berkeley: University of California Press, 1977); and S. Toulmin, *Human Understanding: The Collective Use and Evolution of Concepts* (Princeton: Princeton University Press, 1972).
2. For an overview of the trend see E. LePore & J. Fodor, *Holism: A Shopper's Guide* (Oxford: Blackwell, 1991). An early and trenchant critique of pure experience was W. Quine, 'Two Dogmas of Empiricism', in *From a Logical Point of View* (Cambridge, MA: Harvard University Press, 1961), pp. 20–46. For the extension of meaning holism to theories of belief see W. Quine & J. Ullian, *The Web of Belief* (New York: Random House, 1970).
3. See, for example, D. Pears, *Motivated Irrationality* (Oxford: Clarendon Press, 1984).
4. The importance of rational or reasonable explanations within the human sciences has long been recognised. See from among many R. Collingwood, *The Idea of History*, ed. T. Knox (Oxford: Clarendon Press, 1946), pp. 205–231; W. Dray, *Laws and Explanation in History* (Oxford: Oxford University Press, 1957); M. Oakeshott, 'Historical Events', in *On History and Other Essays* (Oxford: Blackwell, 1983), pp. 45–96; and G. von Wright, *Explanation and Understanding* (London: Routledge, 1971).
5. See footnote 2 above.
6. One notable exception is Kuhn's admirable concern to allow for 'inventions, or novelties of theory,' as well as 'discoveries of fact,' and his equally admirable recognition of the 'exceedingly artificial' nature of the distinction between the two. Kuhn, *Structure of Scientific Revolutions*, p. 52.
7. J. Altholz, 'The Warfare of Conscience with Theology', in J. Altholz, ed., *The Mind and Art of Victorian England* (Minneapolis: University of Minnesota Press, 1976), pp. 58–77.
8. Kuhn, *Scientific Revolutions*, p. 65.
9. Kuhn, for example, rather surprisingly talks of anomalies appearing because of a 'recognition that nature has somehow violated the paradigm-induced expectations that govern normal science.' *Ibid.*, pp. 52–3. Surely, however, it is people's inter-subjective beliefs about nature, not nature itself, which challenge paradigms.
10. Popper, *Objective Knowledge*, p. 242.
11. L. Wittgenstein, *Philosophical Investigations*, trans. G. Anscombe (Oxford: Blackwell, 1972), pp. 143–242.
12. It has been argued that the language in which we discuss beliefs does not even provide a means of making such conjectures but only of living together. See A. Morton, 'Folk Psychology is not a Predictive Device', *Mind* 105 (1996), 119–37. Surely, however, it enables us to live together precisely because it provides us with a means of making such conjectures.
13. See respectively K. Marx, 'Preface to A Critique of Political Economy', in Karl Marx: *Selected Writings*, ed. D. McLellan (Oxford: Oxford University Press, 1977), pp. 388–391; M. Foucault, *The Order of Things* (London: Tavistock, 1971); and L. Namier, 'Human Nature in Politics', in *Personalities and Powers* (London: Harper Torchbooks, 1955), p. 4.

