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Naturalized Epistemology

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Naturalized epistemology

Epistemology, the theory of knowledge, is one of the central areas of philosophy. The questions addressed by epistemology have historically included what knowledge is, how we can or should achieve it, and how much, if anything, we can know.

Naturalism is the view that the world contains only natural phenomena, and that the appropriate methods for acquiring knowledge of the world are those of the sciences. The term 'naturalized epistemology' was introduced by W. V. Quine in his 1969 essay 'Epistemology Naturalized', in which he defends a naturalistic approach to epistemology, arguing that epistemology should be regarded as continuous with, or even part of, natural science.

Epistemological naturalists often contrast their approach to that taken by René Descartes (Descartes [1642] 1996). Descartes held that knowledge has a foundational structure. At the foundation are beliefs which we 'clearly and distinctly perceive', and about which we are therefore completely certain. For Descartes, these include beliefs about the contents and operations of our own minds. Other beliefs must be inferred from these foundational beliefs in order for us to be justified in holding them. Until we can show, on the basis of foundational beliefs, that there is a world outside our own minds, and that proper scientific methods will reliably give us information about it, we can have no confidence in the results of the sciences.

Advocates of a naturalized epistemology see the role of epistemology very differently. For them, philosophy does not come prior to science. The starting point of epistemology should not be our introspective awareness of our own conscious experience, but rather the conception of the larger world that we get from common sense and science. Most naturalists would also reject many other features of Descartes' epistemology, including the view that knowledge requires certainty; the view that all our knowledge must be inferred from foundational beliefs; and the view that it is possible to know substantive facts about the world a priori, that is, without needing experience to provide evidence of their truth.

Of the three main epistemological issues, i.e. the nature of knowledge, the means of acquiring it, and its extent, Quine's naturalized epistemology focuses on the second, the issue of how knowledge is acquired. In a famous passage, Quine describes what he sees as the proper subject of naturalized epistemology:

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 meagre 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: 82-83).

For Quine, then, naturalized epistemology is the empirical study of how human beings develop a theory of the natural world on the basis of their sensory inputs. Given this understanding of epistemology, it is clear why Quine thinks that 'epistemology, or something like it, simply falls into place as a chapter of psychology' (Quine 1969: 82).

However, much of epistemology as traditionally conceived seems to be left out of Quine's picture, and contemporary epistemological naturalists differ in how they think these topics should be addressed. First, one of the main concerns of epistemology has been to understand what knowledge is, in the sense of identifying necessary and sufficient conditions for knowing something. This seems to require an analysis of the concept of knowledge rather than an empirical investigation of the natural world. Some naturalists believe that epistemology should simply abandon conceptual analysis; some accept that conceptual analysis is a necessary and non-scientific part of epistemology, and conclude that only parts of epistemology can be naturalized; and some hold that conceptual analysis itself should become an experimental discipline.

A second aspect of traditional epistemology that Quine seems to neglect concerns the second epistemological question, that of how we do or should acquire knowledge. Many critics of Quine have noted that by focusing exclusively on the descriptive issue of how we in fact base a rich theory of the world on limited evidence, Quine appears to neglect normative issues about how we ought to modify our beliefs in light of new evidence. Some moderate epistemological naturalists concede that such issues cannot be regarded as part of science, while others have suggested that even normative issues can be naturalized.

A final issue that Quine pays little attention to relates to the third epistemological issue, that of how much knowledge, if any, we can have. Quine recommends treating the issue of the extent of our knowledge as internal to science. However, a main focus of traditional epistemology has been to address whether it is possible to convincingly refute radical scepticism, the idea that all or most of our beliefs could be seriously mistaken. To address this question by appealing to the results of science seems to beg the question. Can there be a naturalistic response to radical scepticism? Most contemporary naturalists would concede that they cannot refute scepticism, but would also hold that the only sceptical doubts worth taking seriously are those that arise from within science itself.

1. Hume's anticipation of naturalized epistemology

This section notes some important features of Hume's eighteenth-century epistemology which can be seen as foreshadowing naturalized epistemology. Section 2 examines the twentieth-century background to Quine's 'Epistemology Naturalized'. Sections 3, 5, and 6 then take up, in turn, the views of contemporary naturalists on the three aspects of traditional epistemology that seem most resistant to being naturalized: the conceptual analysis of the nature of knowledge; the investigation of normative issues about the rationality of belief; and the problem of scepticism. Section 4 gives a

more extended treatment of an important distinction briefly mentioned in section 3, between the internalism of Cartesian epistemology and the externalism favoured by naturalists.

The naturalizing movement in epistemology is the continuation of Hume's rebellion against Descartes' view about knowledge. Like Descartes, Hume wanted to conduct an investigation of the mind and its operations, including 'the operations we perform in our reasonings'. But five features of Hume's approach place him far closer to contemporary naturalism than to Cartesianism.

First, while Descartes wished to leave no room for doubt, Hume explicitly took for granted the trustworthiness of the very faculties whose operations he wanted to investigate. Later epistemological naturalists make a parallel move: they trust the techniques and assumptions of science even while investigating how (scientific) knowledge is possible. Hume assumed that our mental faculties are trustworthy because it would be pointless to attempt to test their accuracy; after all, any test required their use. In fact, it was *because* Hume supposed that the mental faculties generated knowledge (or at least rational belief) that he thought the clarification of their workings would shed light on the normative question of what an epistemic agent ought to believe. His project still had a critical edge, for when Hume found any belief that could not be satisfactorily accounted for in terms of the normal functioning of standard human faculties, he recommended throwing it out as baseless.

Second, like later naturalists, Hume modelled his epistemology after the emerging natural sciences, where empirical confirmation served as the basis for claims. He thought that knowledge encompasses everything we can discover using all our mental faculties, including experience and what we can discover by applying our mental faculties to themselves.

Third, like contemporary naturalists, Hume was prepared to say that some knowledge is the product of purely causal mechanisms rather than reason (or reasoning). Indeed, through introspection Hume thought he could detect just such a causal mechanism at work. This mechanism produces knowledge of causal relations, on the basis of which we believe in matters of fact, which are facts that hold contingently and whose negations indicate real possibilities (see Hume, D. §2; Causation §1). Psychological habit, which Hume calls 'custom', prompted by experience, is the mechanism through which we form our suppositions concerning causal relations. Hume does not recommend doubt about the products of custom. After all, the mind is functioning normally when it is under the influence of custom, and reasoning can begin only after custom does its work. We should begin to question our beliefs only when we find that they are arrived at while the mind is not functioning in the normal way science describes.

Fourth, like many contemporary naturalists, Hume explained some of the mechanisms responsible for knowledge (such as custom) in terms of survival value. The linking of causes to effects is so important to human survival that it would have been a mistake for 'nature' to entrust it to our reason 'which is...extremely liable to error'. Better to entrust it to 'some instinct or mechanical tendency, which may be infallible in its operations, may discover itself at the first appearance of life and thought, and may be independent of all the laboured deductions of the understanding' (Hume [1748/51] 1975: 55). Years later, W.V. Quine and other naturalists will speak in the same vein.

Quine (1974: 20) explains induction in terms of natural selection, and disavows any claim to have justified induction. 'In the matter of justifying induction we are back with Hume, where we doubtless belong'.

Fifth, Hume is with contemporary naturalists in their reactions to scepticism. As he had to, since he put his trust in his faculties, Hume rejected Descartes' idea that to know that our beliefs are true is to be in a position to place all our beliefs beyond doubt at once. Hume saw that it is not even possible to *justify* all our views at once. No more than Descartes could Hume use his faculties to assess his epistemic prospects without first assuming that they were reliable. In the last section of the *Enquiry Concerning Human Understanding* ([1748/51] 1975: 149-150), Hume classifies and discusses various varieties of scepticism; although he finds value in scepticism which arises 'consequent to science and enquiry', he devotes only two paragraphs to Cartesian scepticism, which he describes as 'antecedent to all study and philosophy', writing that 'The Cartesian doubt . . ., were it ever possible to be attained by any human creature (as it plainly is not) would be entirely incurable'.

2. Quine and the relation between philosophy and science

Although contemporary epistemological naturalists often define their project in part by its opposition to the Cartesian tradition, Quine's primary target was a conception of philosophy common to much of early twentieth-century empiricism, especially the logical positivist movement and its heirs. Quine described and criticized this conception of philosophy in his essay 'Two Dogmas of Empiricism' (1953), and it is this criticism which provides his motivation for recommending that epistemology be naturalized.

According to the logical positivists, there were two sorts of sentences. Some sentences are 'analytic', i.e. true simply by virtue of the meanings of the terms they contain (see Analyticity). 'All bachelors are unmarried' is a simple example. These sentences can be known a priori, that is, without needing to be justified on the basis of experience. But they also have no empirical content: they express necessary truths, propositions which would be true regardless of what the natural world is like, and therefore they tell us nothing about the world. The second type of sentence is 'synthetic'. These are sentences which are not true simply by virtue of meaning. They can only be known a posteriori, that is, on the basis of experience, and they do have empirical content; they say something substantive about the way the world is.

The rationalist philosophers had held, in Kant's terminology, that there were 'synthetic a priori' truths: truths which made substantive claims about the world, but which could nevertheless be known a priori. They had held that such truths are the subject matter of philosophy, which can therefore discover important features of reality without needing empirical methods. The logical positivists and their heirs denied that there were any synthetic a priori truths, and thus they held that much of philosophy as traditionally conceived was impossible. Instead, they saw the role of philosophy as the discovery of analytic truths. In particular, an important role of philosophy would be to show how to translate the theoretical claims of the sciences, and even sentences about ordinary physical objects, into sentences that merely described observations. Although these truths discovered by philosophy would be analytic and a priori, and therefore would have no empirical content, they would still have an important role to play: by clarifying the relation between theoretical sentences

and observation sentences, they would also clarify the relation between theory and evidence, and do so in an entirely a priori way, without using empirical methods or relying on the results of science.

Onto the positivists' project, Quine dropped a bombshell. In 'Two Dogmas of Empiricism', he argued that there was no substantive distinction between analytic and synthetic sentences. Theories as a whole were true partly by virtue of meaning and partly by virtue of fact, but there was no way to disentangle the two components sentence-by-sentence. There were no analytic sentences (or at least no interesting, non-trivial analytic sentences that could be discovered only by philosophy).

Whether Quine's critique of the analytic-synthetic distinction is correct remains controversial (see Analyticity). However, if it is correct, then the idea that philosophy is an a priori investigation which reveals analytic truths cannot be maintained. In particular, the idea that epistemology could clarify how knowledge is justified, how theory is supported by evidence, by an a priori investigation cannot be correct. Thus, Quine's critique of early twentieth-century empiricism leads naturally to his view in 'Epistemology Naturalized' that epistemology should be an empirical discipline continuous with science.

Once we drop the idea that 'the epistemologist's goal is validation of the grounds of empirical science' we can and should, Quine says, 'surrender the epistemological burden to psychology'. We are to construe epistemology as the attempt to 'understand the link between observation and science', and consider ourselves 'well advised to use any available information, including that provided by the very science whose link with observation we are seeking to understand' (Quine 1969: 75–6). Hence epistemology collapses without residue into sciences such as biology and psychology. Its work is turned over to evolutionary epistemologists such as Campbell (1974) and genetic epistemologists such as Jean Piaget who attempt to explain the development of knowledge, the former explicitly in terms of the biological theory of evolution. But exactly how the sciences will distribute the work of studying knowledge is unclear. The scientific fields that study knowledge are somewhat fledgling and are not clearly differentiated. Nor is it clear how these fields are related to the sociology or sociobiology of knowledge, fields which also can be construed as part of naturalized epistemology (see Sociology of knowledge).

Although Quine criticizes the version of empiricism adopted by the logical positivists and their immediate successors, he explicitly affirms a version of Humean empiricism:

It was sad for epistemologists, Hume and others, to have to acquiesce in the impossibility of strictly deriving the science of the external world from sensory evidence. Two cardinal tenets of empiricism remained unassailable, however, and so remain to this day. One is that whatever evidence there is for science is sensory evidence. The other...is that all inculcation of meanings of words must rest ultimately on sensory evidence (Quine 1969: 75).

But Quine and other contemporary naturalists do not have in mind the introspective sort of empiricism advocated by Hume but, rather, intersubjective empiricism. Instead of simply taking our mental faculties and the data of introspection for granted and accounting for knowledge from that perspective, Quine and other naturalists suggest

that we take a more full-bodied version of scientific practice for granted. The empiricist science on which naturalists rely is conducted in the public domain. Scientists use microscopes and other instruments to extend their senses, and the observations upon which they rely are not data of introspection but rather observations that are at least in principle publicly confirmable (see Empiricism; Introspection).

3. Conceptual analysis and the nature of knowledge

All naturalists reject the Cartesian view that epistemology is entirely separable from and prior to other disciplines such as the sciences. But whether any part of epistemology requires a distinctively philosophical approach is controversial. One area of epistemology that seems resistant to being naturalized is the analysis of the nature of knowledge. Much of twentieth-century epistemology has been devoted to the task of finding necessary and sufficient conditions for knowledge. It would be widely agreed that a subject knows a proposition only if the subject believes the proposition to be true, and the proposition is in fact true. But these two conditions, although necessary for knowledge, are clearly not sufficient: some of our beliefs are true by accident, not because we have good grounds for them. Determining what else is required for knowledge has turned out to be surprisingly difficult. Very roughly speaking, contemporary answers have fallen into two categories. Internalist answers have held that what is required in addition to true belief is some sort of justification which is internally accessible to the agent. Externalist answers, by contrast, hold that what is required is that the belief be produced in a certain way, regardless of whether the agent is aware of this fact. Cartesian epistemology is internalist, while epistemological naturalists who address this issue have been externalists; the contrast between the two is explored further in the following section.

By what method, though, can philosophers determine the conditions that are necessary and sufficient for having knowledge? The approach taken by nearly all the epistemologists who have analysed the nature of knowledge has been to construct analyses, determine what those analyses imply for whether we do or do not know something in specific hypothetical examples, and then compare those implications with our 'intuitions', our pretheoretical, unreasoned views about whether one has knowledge in the hypothetical case. This is an armchair methodology which relies only on the philosopher's intuitions, not on any sort of empirical investigation, and the results have typically been taken to be a priori truths about the nature of the concept of knowledge or about the meaning of the term 'know'.

Quine obviously would have no sympathy with this approach, since it presupposes that we can discover conceptual or analytic truths by a priori means. Some contemporary naturalists would follow him in simply abandoning the analysis of the nature of knowledge as a reasonable task for epistemology. Hilary Kornblith (2002), for example, has argued that investigating the concept of knowledge is of little interest or significance. He points out that no one would think we could discover interesting or important truths about gold by investigating our concept of gold. What we need instead is an empirical investigation of the nature of real examples of gold. He goes on to suggest that precisely the same thing is true of knowledge. He argues that knowledge, like gold, is a 'natural kind'. Natural kinds are kinds of things that figure in scientific laws and principles; they have a common nature that we can discover by scientific investigation. Kornblith argues that the fact that knowledge figures

prominently in the theories of cognitive ethologists shows that it is a natural kind, and recommends that we investigate knowledge itself rather than our concept of it.

However, some epistemological naturalists who are sympathetic to conceptual analysis have suggested that it might be naturalistically acceptable. One possible approach is to maintain the idea that conceptual analysis yields a priori truths, but also hold that a naturalistic account of a priori knowledge is possible. Alvin Goldman (1999) presents a version of naturalism which 'makes no commitment to any thoroughgoing form of empiricism', and on which 'rational insight or rational apprehension might be among the sources of epistemic warrant'. This sort of naturalism seems compatible in principle with the view that conceptual analysis can yield a priori knowledge.

A second naturalistic approach to conceptual analysis holds, by contrast, that the findings of conceptual analysis are not a priori but empirical. On this approach, one's 'intuitions' are not a priori insights but simply judgments one is inclined to make which require a psychological explanation. Analysing a concept by reference to one's intuitions is just a way of learning empirical facts about one's psychology. Of course, if one adopts this approach, one will soon realize that the traditional philosophical approach to conceptual analysis is not a very careful procedure for discovering psychological facts. On a more scientific approach, one would try to control for various factors that may influence one's judgments, and one would also want to survey many people to discover to what extent intuitions are shared and to what extent they differ. Philosophers have recently begun taking just such an approach under the name 'experimental philosophy'. Much of this work has not been aimed at analysing concepts, but it seems possible to turn it to this purpose. In addition, experimental philosophy has paid more attention to intuitions about ethics and intentional action than to those about knowledge, but 'experimental epistemology' has recently begun to receive attention (Alexander and Weinstein 2007).

4 Internalism versus externalism

Naturalists think that the stimulation of sensory receptors helps to determine whether or not people know the truth of beliefs that are causally linked to those stimulations. Yet the stimulations themselves are usually not noticed by the people in whom they occur. Thus naturalists are *externalists*, defined by Laurence Bonjour (1985), following D.M. Armstrong (1973), as theorists according to whom facts that are external to an agent's conception of the situation can serve to justify that agent's beliefs in a way that is sufficient for knowledge (see Internalism and externalism in epistemology). *Internalists*, by contrast, would insist, like Descartes, that all knowledge is based on justifications that are in some sense in the cognitive possession of the knower. A related view is that epistemology, or knowledge about knowledge, is based on such justifications. Consider the following arguments for these internalist positions.

First, as Bonjour emphasizes, justifications that are in no way possessed by an agent are completely arbitrary (unsupported), at least so far as the agent can tell from the agent's own point of view, and accepting arbitrary beliefs is a bad idea from the standpoint of getting to the truth, which is the goal of the epistemic agent. Yet externalists claim that it is possible for agents to acquire knowledge through sources about which those agents believe little or nothing. Their sources might be a causal

chain, a reliable belief-formation process, an information channel, or all three (see Knowledge, causal theory of; Information theory and epistemology; Reliabilism). Internalists disagree, since it is epistemically irresponsible to believe something through some avenue without checking out the truth-conductivity credentials of that avenue.

The main problem with this first line of thought is that the internalists' assumptions seem to lead immediately to sceptical results. For internalists want an avenue to the truth but they want to accept nothing except what is justifiable, and nothing as justification except what is available to them 'from the inside'. That means they need an avenue to the truth that can be defended as such on the basis of what is available 'from the inside', a task that appears to be impossible. No empirical premise will serve in the defence since empirical premises will either be accepted without justification (arbitrarily) or justified on the basis of some other empirical premise, thus initiating a regress.

A second line of argument gives up on the attempt to show that all knowledge conforms to internalist assumptions, but purports to show that epistemology fits the internalist view: since logic is a priori accessible if any body of knowledge is, the thought that there is an inductive as well as a deductive logic may lead theorists to suggest that knowledge is the product of reasoning that conforms to valid deductive and inductive forms of argument. Some of the assumptions that are fed into the arguments might not conform to internalist assumptions, but the reasoning does. So we can understand epistemology to be an a priori study of the argument forms to which reasoning ought ideally to conform.

One problem here is that, unlike deductive logic, inductive logic is not the study of argument forms. Ultimately inductive logicians invoke appeals to the way the world is, appeals which internalists want to avoid. Except in trivial cases, that one statement makes another probable is a claim about the world, not about the forms of those statements. More seriously, in the phrase 'reasoning that conforms to valid argument forms' there is a conflation of argument with reasoning. As Gilbert Harman (1986) and others have emphasized, these are quite distinct things. The study of arguments and argument forms is logic; the study of reasoned belief revision is the study of the belief-management practices governing those revisions. Principles of belief management would tell us when epistemic agents should retain their beliefs and when and how they should revise them. The inference rules of logic do not tell us when revision is appropriate. Inference rules can tell us many things; for example, suppose that we believe the premises of an argument – inference rules can tell us that the premises of that argument entail its conclusion. But that is not the same thing as a recommendation that (say) we affirm the conclusion. In fact, belief-management principles might tell us that we ought to drop one of the premises rather than accept the conclusion.

Once we distinguish between logic and belief management, like Harman we may become quite sceptical about the existence of anything like an inductive logic. An inductive logic would be a logic that resembles deductive logic except that the conclusions of 'valid' inductive arguments are merely made probable by their premises, not entailed by them. That such a logic exists is not entailed by the existence of inductive reasoning, and the fact that so little progress has been made towards developing an inductive logic might lead us to suspect that there is no such

subject to be investigated (see Inductive inference). Moreover, if inductive logic does not exist, good inductive reasoning cannot be simply reasoning that conforms to inductive logic. (Some have held that probability theory provides the basis of inductive logic – see Probability theory and epistemology.)

So the epistemic activity of inductive reasoning might not be illuminated by advances in ‘inductive logic’. A related point is that much epistemic activity probably does not involve beliefs or any other proposition-related states at all. As Paul Churchland (1979: 128) has argued, a great deal of information is processed by infants, and their prelinguistic behaviour does not invite ascriptions of propositional attitudes to them. ‘Rational... intellectual development in an infant cannot be...usefully represented by a sequence of sets of sentences suitably related’. Information processing in infants, as well as the processing by virtue of which sensory stimulations are assimilated by adult brains prior to the formation of beliefs, would presumably be articulated by principles of which epistemic agents themselves are entirely unaware and to which they could not purposely conform even if they wanted to. Churchland takes such facts to suggest that any account of knowledge in terms of ‘sentences suitably related’ is bound to be superficial; a proper theory would deal in more primitive parameters that apply to pre-linguistic processing, and would account for the way epistemic agents deal with beliefs as a derivative case.

In sum, critics of naturalized epistemology who say that knowledge or epistemology is based on justifications in the cognitive possession of knowers face some severe difficulties.

5 The role of normative issues

Another issue addressed by traditional epistemology that does not seem amenable to scientific methods concerns normative issues. Epistemology’s *descriptive* task is to identify how people actually arrive at beliefs. But what people actually do is not necessarily what they ought to do. Epistemology’s *normative* task is to identify how people ought (rationally) to arrive at their beliefs, and this seems to go well beyond the descriptive task (see Normative epistemology). Not all naturalists hope that they can do away with traditional epistemology entirely and replace it with natural science. But those with this hope have trouble finding a place in their project for the normative task of epistemology, since science seems incapable of prescription. Radical naturalists could argue that the normative issue is not worth pursuing, so that reducing epistemology to its descriptive task leaves out nothing worth doing. But this is an implausible option on its face. However, their only other choice is daunting: they must argue that science can tell us how we ought to arrive at our beliefs.

Naturalists who want to argue that science can answer the normative question have two options. In the spirit of Hume they can assume that the way we arrive at our beliefs *is* (more or less) the way we ought to. (But is this assumption a scientific or an epistemological claim?) Epistemology’s descriptive task is clearly within the province of science; if we completed the normative by completing the descriptive task, then science could handle both sides of traditional epistemology. Unfortunately, the claim that we ought to maintain our existing belief-management practices more or less as they are faces difficulties. The main problem lies in the data that psychologists have already gathered. These data appear to show that normal human cognitive processes are shot through with faulty logic, bad probabilistic inferences and wishful thinking

(Nisbett and Ross 1980; Taylor 1989). Beliefs with such origins do not count as knowledge. It should be noted, however, that some more recent work has questioned whether the classic experiments on human irrationality actually demonstrate that humans are bad reasoners (e.g. Oaksford and Chater 2007; Cosmides and Tooby, 1996).

Perhaps radical naturalists need not assume that people ought to maintain their actual belief-management practices, however. Instead, they could try arguing that discoverable facts about things other than our actual belief-management practices will allow us to accomplish epistemology's normative task (but will they be able to make these discoveries without relying on the belief-management practices they question?). For example, scientists might be able to determine that all human beings have a common epistemic goal, such as reaching the truth or predicting the future course of sensory stimulation. If so, then, as Quine (1992) has pointed out, epistemology's normative task could be performed by engineers. Engineers could work out the best ways available to people (given our limited faculties and resources) for reaching their epistemic goal. We could say that these efficient methods are the ones people ought to adopt, even at the expense of fairly radical changes in their actual practices. Normative epistemology becomes part of engineering science, not a branch of epistemology that is outside of science.

But while engineers investigate efficient ways to do such things as to transport or kill people, they do not investigate the issue 'Ought we to transport or kill people?' Only after it is established that it is important to achieve some goal does engineering come into play. The issue of what epistemic agents ought to aim at is not an engineering issue. It remains a philosophical issue which cannot be absorbed into science.

The problem would be rather trivial if scientists discovered that there is a single, unvarying goal (or prioritized set of goals) which everyone wants to reach by managing their beliefs as they do, and which does not look silly on its face. Even if the goal is 'wired in', we would worry about committing a 'naturalistic fallacy' and say 'The fact that something is everyone's goal does not entail that it ought to be'. Even the fact that a goal is forced on everyone does not show that we have grounds for pursuing it. Still, the temptation to take this goal as the one we ought to pursue would probably be overwhelming. However, it is by no means obvious that such a single, unvarying goal exists. In different cultures at the same time, and in the same culture at different times, people might be aiming to accomplish a variety of things by believing what they do, and the (conscious and unconscious) belief-management principles they employ might also differ widely. Given the possibility of significant diversity, epistemologists need some way to decide which competing goals and sets of belief-management principles are right for cognitive agents. Perhaps the diversity would be reduced if we focused on the goals of scientists during those times when they are being scientific. But even if it were so reduced, we would need some way of arguing that the goals of the scientists are the ones which epistemic agents ought to pursue. Several ways to handle such normative issues are open to radical naturalists.

First, they could say that belief-management principles should be evaluated from the point of view of natural selection, so that the greater the survival value of these principles, the better the principles. Once this (epistemological?) claim is made, then science can take over, by describing the belief-generating mechanisms of human beings (and other animals?) and explaining how they have the survival value they do.

(But how will naturalists absorb the growing data that suggest that wishful thinking, a paradigm case of irrationality, is adaptive?)

Second, as noted in the previous section, some naturalists are prepared to accept conceptual analysis as naturalistically acceptable. If so, perhaps conceptual analysis can reveal what epistemic agents' goals or evaluative concepts are, for example by showing that it is a constitutive feature of the concept of belief that belief aims at the truth (Shah 2003). If conceptual analysis were to reveal that truth or predictive power is the goal of epistemic agents, then scientists could go on to clarify the extent to which people naturally achieve the epistemic aim, and engineering may help to find better ways to achieve this aim.

Third, Stephen Stich (1988) suggests a pragmatic approach to normative issues. First he criticizes the strategy of using conceptual analysis to discover the goals and concepts of epistemic agents. The goals and evaluative epistemic concepts that are part of ordinary language are as likely as belief-management principles themselves to vary from culture to culture (see Cognitive pluralism). So it is arbitrary to rely on them when we select management principles. 'In the absence of any reason to think that the locally prevailing notions of epistemic evaluation are superior to the alternatives, why should we care one whit whether the cognitive processes we use are sanctioned by those evaluative concepts?' (Stich 1988: 406). Then Stich points out that there are many common values, such as happiness or reproductive success, that are not epistemic values but can be considered relevant to our cognitive lives. Stich suggests a pragmatic approach: he makes the (epistemological? ethical?) claim that we should evaluate belief-management principles from the standpoint of these non-epistemic values. Here again theoretical science will help us to evaluate our actual belief-forming mechanisms and engineering will help us to improve upon them.

6 The significance of scepticism

Like Hume, contemporary naturalists view epistemology as the attempt to clarify how the apparatus people use in investigating the world works when used in applications for which, we assume, it is reliable, and to identify what ought and ought not count as knowledge by identifying what sorts of beliefs are endorsed by the proper use of that apparatus. Contemporaries depart from him chiefly in thinking that more must be taken for granted than the reliability of mental faculties. Recent naturalists help themselves to the whole of natural science, which can be thought of as the combination of our mental faculties with techniques and devices that extend them.

Accordingly, there is a compelling case for saying that naturalists cannot hope to put global scepticism to rest. Global scepticism says that our belief schemes (including science) are irrational because: (1) ultimately our beliefs are based on arbitrary assumptions, claims that, even upon some reflection, we cannot link to considerations that suggest they are true; and (2) it is irrational to make arbitrary assumptions (see Scepticism §5). To argue that scientific apparatus is reliable after having simply assumed that it is would be circular, so naturalists seem committed to granting (1). Perhaps this is why naturalists rarely confront global scepticism.

Attempts, none the less, have been made. One approach involves *coherentism*, which is the claim that beliefs may derive justification by cohering one with another (see Knowledge and justification, coherence theory of). If coherentism were correct, then since it sanctions some circular justifications, naturalists could use it against (1), and

argue that all our beliefs can be justified at once. Another common approach is to turn the tables on the global sceptic and point out that, like everyone else who investigates knowledge, sceptics, too, must take for granted the reliability of their investigative apparatus. As an attack on (1) this table-turning would not work. Sceptics can retort: ‘Yes, all of us are in the same boat: there are assumptions we simply take for granted’. But it might well prove useful as part of an attack on (2).

It is important to notice that the global sceptic needs both (1) and (2). Once we do, we can see that even if naturalists cannot defeat (1), they can still respond to scepticism if they defeat (2). Naturalists could accept the sceptic’s discovery that ultimately our views are, perforce, arbitrary, and insist that it is sometimes all right, it is sometimes rational, to believe things we simply take for granted (Luper-Foy 1990).

References and further reading

Alexander, J. and J.M. Weinberg (2007) ‘Analytic Epistemology and Experimental Philosophy’, *Philosophy Compass* 2 (1): 56-80. (Discusses challenges posed by experimental philosophy for analytic epistemology as traditionally practiced, as well as ways epistemology might be reformed.)

Armstrong, D.M. (1973) *Belief, Truth and Knowledge*, Cambridge: Cambridge University Press. (Referred to in §4. A difficult, technically sophisticated but groundbreaking defence of an externalist theory of knowledge.)

BonJour, L. (1985) *The Structure of Empirical Knowledge*, Cambridge, MA: Harvard University Press. (Discussed above in §4. Important and highly accessible defence of an internalist approach to the theory of knowledge.)

BonJour, L. (2002) *Epistemology: Classic Problems and Contemporary Responses*, Lanham, MD: Rowman & Littlefield. (A survey of epistemology from an internalist and foundationalist perspective. Chapter 10 discusses internalism and externalism; Chapter 11 argues that ‘there is no clear and defensible sense in which epistemology either can or needs to be naturalized’.)

Campbell, D.T. (1974) ‘Evolutionary Epistemology’, in P.A. Schilpp (ed.) *The Philosophy of Karl Popper*, bk 1, La Salle, IL: Open Court. (Referred to in §2 above. Helpful account of the field of evolutionary epistemology.)

Churchland, P. (1979) *Scientific Realism and the Plasticity of Mind*, Cambridge: Cambridge University Press. (Discussed in §4 above. Reasonably accessible and influential attack on the idea that knowledge is ‘sentences suitably related’.)

Cosmides, L. and J. Tooby (1996) ‘Are Humans Good Intuitive Statisticians After All? Rethinking Some Conclusions from the Literature on Judgment under Uncertainty’, *Cognition* 58 (1): 1-73. (Referred to in §5. Argues that the classic experiments on errors in human judgments of probability may not show that humans are bad at such reasoning.)

Descartes, R. ([1642] 1996) *Meditations on First Philosophy*, ed. J. Cottingham, Cambridge: Cambridge University Press. (The classic defence of epistemology as ‘first philosophy’; explicitly defends many theses rejected by epistemological

naturalists, including foundationalism, internalism, and the possibility and importance of a priori knowledge.)

Feldman, R. (1999) 'Methodological Naturalism in Epistemology', in J. Greco and E. Sosa, eds., *The Blackwell Guide to Epistemology*, Oxford: Blackwell. (A very accessible critique of naturalized epistemology; argues that many epistemological issues are not empirical and do not require input from psychology.)

Goldman, A. (1986) *Epistemology and Cognition*, Cambridge, MA: Harvard University Press. (Discussed in §4. Reasonably accessible and influential defence of a moderately naturalized epistemology.)

Goldman, A. (1999) 'A Priori Warrant and Naturalistic Epistemology', *Philosophical Perspectives* 13. (Argues that naturalized epistemology is compatible with the existence of a priori justification and knowledge.)

Goldman, A. (2005) 'Kornblith's Naturalistic Epistemology', *Philosophy and Phenomenological Research* 71 (2): 403-410. (Defends a role for conceptual analysis in a naturalized epistemology.)

Harman, G. (1986) *Change in View: Principles of Reasoning*, Cambridge, MA: MIT Press. (Discussed in §4 above. Highly accessible defence of a moderately accessible naturalized epistemology.)

Hume, D. (1748/51) *Enquiries Concerning Human Understanding and Concerning the Principles of Morals*, ed. L.A. Selby-Bigge, revised P.H. Niddich, Oxford: Clarendon Press, 3rd edn, 1975. (Referred to in §2 above. A hugely influential text. Hume writes clearly and elegantly, but contemporary readers can nevertheless find his eighteenth-century prose challenging.)

Kitchener, R.F. (1986) *Piaget's Theory of Knowledge: Genetic Epistemology and Scientific Reason*, New Haven, CT: Yale University Press. (Exhaustive discussion of genetic epistemology.)

Kitcher, P. (1992) 'The Naturalists Return', *Philosophical Review* 101 (1): 53-114. (A clear and helpful survey and defence of twentieth-century naturalism.)

Kornblith, H. (ed.) (1985) *Naturalizing Epistemology*, Cambridge, MA: MIT Press. (Contains an introductory essay which defends the idea that the distinctive feature of naturalized epistemology is its position on the relationship between the normative question of how we ought to arrive at our beliefs, and the descriptive issue of how we do arrive at our beliefs. Also contains leading naturalist essays and an exhaustive bibliography up to 1984. Most of the material is accessible to non-specialists.)

Kornblith, H. (1993) *Inductive Inference and its Natural Ground: An Essay in Naturalistic Epistemology*, Cambridge, MA: MIT Press. (Accessible and lucid explanation of inductive inference from the perspective of naturalistic epistemology.)

Kornblith, H. (2002) *Knowledge and Its Place in Nature*, Oxford: Oxford University Press. (Readable defence of a thoroughly naturalized epistemology; distinctive for the view that knowledge is a natural kind.)

Kornblith, H. (2007) ‘The Naturalistic Project in Epistemology: Where Do We Go from Here?’, in C. M. Mi and R. Chen, eds., *Naturalized epistemology and Philosophy of Science*, Amsterdam: Rodopi. (An overview of work in naturalized epistemology since Quine, with an emphasis on recent developments, including experimental philosophy, virtue epistemology, and social epistemology.)

Luper-Foy, S. (1990) ‘Arbitrary Reasons’, in *Doubting*, Dordrecht: Kluwer. (Referred to in §6. Argues that it is rational to accept arbitrary beliefs.)

Nisbett, R. and L. Ross (1980) *Human Inference: Strategies and Shortcomings of Social Judgment*, Englewood Cliffs, NJ: Prentice Hall. (Referred to in §5. Accessible survey of literature on irrationality.)

Oaksford, M. and N. Chater (2007) *Bayesian Rationality: The Probabilistic Approach to Human Reasoning*, Oxford: Oxford University Press. (Referred to in §5. Argues that the classic experiments purporting to show errors in human deductive reasoning should be reinterpreted as actually showing good probabilistic reasoning.)

Quine, W.V. (1953) ‘Two Dogmas of Empiricism’, in *From a Logical Point of View*, New York: Harper Torchbooks. (Referred to in §4. Spells out much of the theory that suggested naturalized epistemology. Most of it is accessible.)

Quine, W.V. (1969) ‘Epistemology Naturalized’, in *Ontological Relativity & Other Essays*, New York: Columbia University Press. (Referred to in §2. The definitive essay of naturalized epistemology. Accessible.)

Quine, W.V. (1974) *The Roots of Reference*, La Salle, IL: Open Court. (Referred to in §1. Discusses induction and hints at an externalist refutation of scepticism. Accessible.)

Quine, W.V. (1992) *Pursuit of Truth*, Cambridge, MA: Harvard University Press. (Referred to in §5. Section 8 of this book discusses the role of normativity in naturalized epistemology.)

Shah, N. (2003) ‘How Truth Governs Belief’, *Philosophical Review* 112 (4): 447-482. (Argues that conceptual analysis shows that ‘truth provides an inescapable normative standard for belief’.)

Stich, S. (1988) ‘Reflective Equilibrium, Analytic Epistemology and the Problem of Cognitive Diversity’, *Synthese* 74 (3): 391–415. (Discussed above in §5. Defends a pragmatic approach to belief management. Accessible.)

Taylor, S. (1989) *Positive Illusions: Creative Self-Deception and the Healthy Mind*, New York: Basic Books. (Referred to in §5. Very accessible argument for the claim that self-deception is adaptive.)