**Confidence, Humility, and Hubris in Victorian Scientific Naturalism**

Ian James Kidd, University of Nottingham

**Abstract**

Most historians explain changes in conceptions of the epistemic virtues and vices in terms of social and historical developments. I argue that such approaches, valuable as they are, neglect the fact that certain changes also reflect changes in metaphysical sensibilities. Certain epistemic virtues and vices are defined relative to an estimate of our epistemic situation that is, in turn, defined by a broader vision or picture of the nature of reality. I defend this claim by charting changing conceptions of the virtue of epistemic humility in 19th century intellectual culture, focusing on claims about the humility or hubris of the Victorian scientific naturalists.

**Introduction**

It is clear that the epistemic virtues and vices recognised by scientists and humanists change over time. Some virtues come and go, even as others remain fairly stable, and others still can change status, being an excellence of epistemic character at one time, only to later become a vice. A good example is curiosity, barely mentioned by the ancient Greeks, castigated as a vice during much of the medieval period, but gradually rehabilitated, from the early modern period onwards, as one of the most crucial ‘virtues of the mind’ (see Zagzebski 1996). Similar stories about the changing status of other epistemic character traits can been told, even if those histories tend to be neglected by virtue epistemologists. Happily, more studies are emerging that explore the historical development of various virtues in social, religious, and intellectual context (see Cooper 2002 and Pardue 2013).

But the majority of the existing studies of changes in the sorts and types of epistemic virtues and vices have tended to focus on social and historical factors. The shifting conceptions of the ‘scientific self’ depicted by Steven Shapin (2008) are characterised by the virtues appropriate to culturally mandated values. The Godly Naturalist of the 18th century is pious and humble, while the late modern Venture Capitalist is confident, ambitious. Similarly, Lorraine Daston and Peter Galison (2007) chart changing ‘regulative visions’ of the virtues of objective enquirers. A ‘mechanically objective’ scientist is disciplined, restrained, while another, embracing ‘trained judgment’, is discerning, creative. In each case, changes in tables of the virtues are explained in relation to social and historical developments – new technologies, representational techniques, economic imperatives, intellectual developments, and so on.

Such studies are valuable, but neglect a further type of factor crucial to explanations of historical shifts in the epistemic virtues and vices. I refer to changes in the *metaphysical sensibilities* of a culture, to guiding visions of the nature of reality. One might expect interest in the metaphysics of epistemic virtue from those philosophers interested in epistemic virtues – virtue epistemologists. But, surprisingly, very few of them explicitly explore the grounding of the virtues of the mind in such things as worldviews, or indeed to their history. Honourable exceptions are Bob Roberts and Jay Wood, who throughout their book, *Intellectual Virtues*, remark that ‘(epistemic) virtue and vice concepts’ are tacitly ‘indexed’ to ‘metaphysical commitments’, ‘world views’, or a ‘conception of human nature’. The intelligibility and salience of certain virtues and vices can only be explained by reference to the particular ‘worldview’ or ‘metaphysical background’, which those epistemic concepts ‘presuppose’ (2007, 155, 82, 22). When an account of a vice acknowledges its historical and metaphysical grounding, call it a deep conception of epistemic vice (see Kidd MS).

The changing fortunes of curiosity, gestured to earlier, offer a good example of how a certain epistemic character trait requires explanatory appeal to shifting metaphysical visions. In Hans Blumenberg’s account, many medievals followed Augustine in associating *curiositas* with spiritually objectionable attitudes and ambitions. Enthusiasm for enquiry into mundane matters was liable to fuel corrupting pleasure in our ‘cognitive accomplishments’, leading to various vices – ‘cognitive arrogance’, ‘the danger of self-admiration’, or a hubristic sense of ‘autonomous cognitive security’ (1983, 286, 310). Such vices are hardly compatible with the cultivation of a properly pious relationship with God, the primary good for human beings. If so, curiosity offers a case where the normative status of an epistemic character trait – as virtue or as vice – is determined relative to a metaphysical vision or worldview.

Without an appeal to a Christian worldview, argues Blumenberg, it is difficult to give a satisfying account of why *curiositas* came to be ‘enrolled in the catalog of vices’ (1983, 309). Indeed, it was no coincidence that curiosity’s subsequent rehabilitation occurred at the same time as the emergence of new, rival visions of reality, joint products of humanism and natural philosophy. Such visions valorised human powers, encouraging potent new epistemic ambitions and thereby redeeming character traits, like curiosity, conducive to their pursuit.

My focus in this chapter is on a different virtue and a later stage in history. Using the remarks of Roberts and Wood as my starting point, I show that a full explanation of conflicting 19th century conceptions of the virtue of epistemic humility must invoke rival metaphysical visions – a claim I illustrate with the case of Victorian scientific naturalism.

**1. Epistemic confidence**

I start with an account of the virtue of epistemic humility, which I argue is a virtue that registers an appreciation of the conditional status of our epistemic confidence – the confidence invested in activities aimed at the acquisition, assessment, and application of knowledge and other epistemic goods (see further Kidd 2015 and 2016a).

Central to this account is the idea that any given assertion, belief, or conviction will rest upon some set of *confidence conditions*. By that term, I mean the cognitive, practical, or other conditions that ought to be fulfilled if an agent is to have warranted confidence in some epistemic action or commitment. Perhaps confidence would require the agent to have certain sorts of specialist knowledge (*cognitive*) or an ability to perform certain actions (*practical*) or access to certain objects or places (*material*). A historian’s confidence in some claim may be conditional upon their being trained in certain interpretive techniques, having access to a certain archive of documents, and so on. The specific types of confidence conditions will vary according to the specific actions and commitments and the contexts in which they are made – a fact reflected in the complexity of our social and epistemic life.

It is useful to distinguish three levels at which confidence conditions can operate. The first is *agential confidence*, those particular to the specific epistemic agent – perhaps in their general cognitive capacities, knowledge of a subject, or their ‘self-trust’ in their status as one able to pursue and attain truth. But agents must have confidence in others, too, so the second level is that of *collective confidence*, which is invested in both other agents and the structures that organise their activities – disciplines, communities, institutions, and so on. It might be a confidence in the people who teach and train us, or in the sense of fair play of one’s critics, or in the robustness of shared practices, such as anonymous peer review or data-gathering.

As these examples make clear, collective confidence is complex. Colleagues can let us down, shared epistemic practices can be abused, and institutions can be corrupted. The virtue of epistemic humility therefore builds in, at the ground level, an acute sense of the fact that epistemic confidence is conditional, complex, contingent, and therefore *fragile*.

The philosophical literature tends to focus on the agential and collective aspects of our epistemic life. But there is a third, final level: that of *deep confidence*, the more tacit sort invested, by agents and collectives, in something broader and more abstract. Objects of deep confidence might include a project of enquiry – such as rational theology or natural science – or in the richness of a shared inheritance of thought and sensibility. Other objects take more ‘theoretical’ forms: perhaps a deep confidence in the fundamental intelligibility of reality, for instance, or the possibility of progress in a project of enquiry, without which enquiry would be futile and frustrating.

Such objects of deep confidence might seem too obvious to be worth specifying. Yet they are perennially disputed throughout our intellectual history and should not be taken for granted. Indeed, many of the deep rhythms of debate that run through that history can be interpreted as disputes about the sorts of deep confidence to which human beings can and should aspire.

Two points relevant to my later discussion are worth noting. First, the levels at which epistemic confidence operates – the agential, collective, and deep – are not sharply demarked from one another. On the contrary, they interpenetrate and interact, with changes at one level having ramifications for the others. A loss of deep confidence in philosophy, for instance, can precipitate a loss of confidence in its particular practitioners and communities. Early feminist histories of Western philosophy reflected a sense of alienation from a tradition perceived as a ‘repository of misogynist ideas and ideals’, recalls Genevieve Lloyd, later succeeded by projects of ‘appropriation’ that helped to restore confidence – for instance, in its capacity to ‘enrich cultural self-understanding’ (2000, 245). Second, the level of ‘deep confidence’ is indeed deep in the sense of ‘fundamental’, since the agential and collective levels sit on top of it. The fundamentality of deep confidence is central to my later discussion of the claims of 19th century scientific naturalists to be exemplars of epistemic humility.

With these remarks on confidence in place, I now give an account of humility.

**2. Epistemic humility**

I suggested that humility is a virtue marked by special sensitivity to the conditional status of the confidence that is essential to our epistemic life. But to merit the status of a virtue, taken as an excellence of character to be cultivated and admired, humility must do further work. It is only going to be virtuous to be epistemically humble if doing so makes a difference to our epistemic activities and, therefore, to our life.

The virtue of humility is structured around two pairs of components. The first is a disposition to recognise the fulfilment of the confidence conditions that are relevant to a given epistemic act or commitment—an assertion, say, or a conviction—in the ways described in the last section. A humble enquirer is disposed, that is, to recognise the sorts of conditions that might underlie or ‘go with’ that assertion or conviction, and whether or not they do or could fulfil them, either alone, as they stand, or with others, perhaps after further training. It is this sort of humility that is reflected in the idea of ‘knowing (or acting within) one’s limits’. But this is not, in itself, enough to make up a virtue: one could imagine a person who was perfectly good at *recognising* confidence conditions, but who consistently ignored them by ‘holding forth’ regardless – a tendency, surely, of an arrogant person.

So a second component is needed that connects the recognition of confidence conditions to actual changes in how one conducts oneself epistemically. This is a disposition to *regulate* one’s epistemic conduct in the light of one’s changing fulfilment of relevant confidence conditions. A humble enquirer is disposed, that is, to actively regulate their epistemic conduct, their personal ways of engaging in epistemic activities. Perhaps they take care to carefully qualify claims to reflect the degree of confidence they can justify, sharing Montaigne’s fondness for words and phrases that ‘soften and moderate’ the typical ‘rashness’ of our speech – ‘perhaps’, ‘I think’, ‘as far as I know’ (1991, 1165). Perhaps they regulate their ambitions by ensuring the epistemic projects they commit to are ones whose constituent conditions they could fulfil – aspiring to *contribute* to, rather than *define*, an area of study.

Taken together, a humble enquirer is disposed to actively regulate their epistemic conduct by recognising and appropriately responding to the complex economy of confidence upon which their activities and projects rely. Since I have elsewhere given a fuller account of the virtue of epistemic humility (Kidd 2015, 2016a), I will here confine myself to two general remarks. The first is that it is quite consistent with a latent modern conception of humility, and the rhetorics and metaphors associated with it. Think of talk of ‘getting a good grounding’ in a new subject or an epistemological vocabulary of ‘foundations’. Second, this account is domain-neutral, applying to scientific and humanistic enquiry, and ordinary and complex sorts of epistemic activity. A person can be epistemically humble, in the sense described, whether they are measuring solar flares, explaining the rise of fascism, or debating the merits of glam rock over drinks with friends. This neutrality is a deliberate feature of the account in its general form, but humility changes with time. One of the reasons why is that, over time, the objects or modes of deep confidence to which a humble enquirer is attuned change. These changes are, fundamentally, ones of ‘worldview’.

I now say more about the relationship of deep confidence to metaphysical visions, using the case of the virtue of epistemic humility in the context of 19th century scientific naturalism.

**3. Deep confidence**

An enquirer with the virtue of epistemic humility will have sensitivity to the deep confidence conditions that are relevant to their epistemic conduct. It seems likely that much of their life will not require constant and intense focus on the deeper conditions: but, at times, it will and often for the reason that deep confidence can change, either being gained or, indeed, lost.

It is clear that deep confidence can and has taken many forms throughout intellectual history, too many to survey in any detail in this chapter, but certain general sorts stand out. To start with, there is a confidence in the power of human reason to ascertain truths of a suitably profound or complex sort about the world, of the sort classified with the capacious label of ‘rationalism’. Next is a confidence in the methods and ambitions of rational theology or natural science, of a sort that can inspire people to pursue them, despite disappointments, obstacles, and failures. Another is confidence in the ultimate intelligibility of reality – of a trust that the world has an order, if not purpose, accessible by our epistemic capacities.

Several other general forms of deep confidence exist, but these suffice to illustrate two crucial points. One is that these diverse forms or modes of deep confidence can relate to and shape one another in complicated ways—for instance, deep confidence in science as a source of truths about reality (or significant aspects of it, anyway) has, historically, been closely related to a confidence in its progressiveness. This is recognized by that energetic group of critics – antirealists, constructivists, relativists – who have spent much of the last 40 years stridently challenging both components of this double mode of deep confidence in science.

The other crucial point is that deep confidence is typically contingent, in the sense of its being available only if certain conditions are fulfilled. The Biblical myth of the ‘Fall of Man’ that was later developed into postlapsarian theologies, argues the historian Peter Harrison, ‘precipitated a crisis of confidence’ in the cognitive powers of human beings and traditional sources of knowledge. If, epistemologically, ‘error was … equated with sin’, then we ‘fallen’ human beings inherited, along with original sin, a ‘proneness to error’, ignorance, and confusion. But responses to this ‘crisis’ varied, according to theological conviction. Augustine invoked divine ‘grace’ as a ‘cure’ for the ‘inherited malady of sin’, while Aquinas argued that our ‘rational soul’, created by God, contains its own ‘light of natural reason’, which cannot be ‘forfeit’, even after the fall (Harrison 2007, 4, 39, 43). Such appeals to divine grace or ‘natural reason’ can be understood as strategies for the fulfilment of deep confidence conditions, particular to the resources of medieval European Christian culture.

Early modern thinkers inherited similar worries about natural ‘infirmities’ and ‘weaknesses’ of the human mind. Their response was enthusiasm for ‘regimens of the mind’, directed to the ‘cure and cultivation’ of our corrupted yet restorable minds. Sorana Corneanu argues that ‘regimens’ of this sort were understood to be incumbent on a person, ‘as an individual, as a member of a community, and as a creature in relation to its deity’. Such ‘epistemic modesty’ operates at agential, collective, and deep levels, and is ultimately rooted in an ‘anthropological conception’, dictating ‘what the virtuous knower does and is like’, itself embedded in a wider ‘vision’ of reality (Corneanu 2012, 2, 99, 163). Deep confidence, on this account, is conditional on the implementation of ‘cures’, ‘cultures’, or ‘regimens’ for the rectification of our corrupted minds.

The conditional status of deep confidence has implications for the conception of what the virtue of epistemic humility will require of an agent—for instance, does it require that we trust in ‘grace’ or in our ‘natural light of reason’ or rather undertake ‘regimens of the mind’? I want to show, in the remainder of the paper, how 19th century philosophy offers us a diversity of rival metaphysical visions and their associated conceptions of epistemic humility.

**4. Doctrines of deep confidence: Comte, Peirce, and Spencer**

The 19th century was philosophically heir to a rich heritage of developments – early modern disputes between ‘rationalists’ and ‘empiricists’, Absolute Idealism and its critics, and others. I will not attempt a survey of these developments and their relation to my theme of deep confidence. Instead, I offer three examples of 19th century philosophies that include doctrines of deep confidence.

The first is ‘positivism’, today especially associated with the writings of Auguste Comte. Its deep confidence was placed in ‘the progressive growth of the human mind’, guaranteed by the inevitable development of ‘our principal conceptions’ of knowledge through the famous ‘Three Stages’ – the theological, metaphysical, and scientific (or ‘positive’). Such deep confidence runs through Comte’s articulation of positivism, most obviously in the Law of Stage’s assertion of ‘general progress’. But it is there, too, in his emphases on our increasing proficiency in the ‘vast intellectual operation’ of organised science and the efficacy guaranteed by its ‘unity of method’. Comte also, however, notes various conditional constraints on this confidence: it is ‘rash to hope, even in the most distant future’, that positive science could reduce the number of ‘general laws … to a single one’ – a single theoretical description of the world – an epistemic ambition forever beyond our reach. Comte also warns that embrace of narrowly utilitarian conceptions of science would ensure we never surpass the ‘present condition of mental development’ (1988, 1, 2, 22, 30, 32, 41). In Comte’s writings, then, is an account of the conditional status of our deep confidence, of a sort that can provide the basis for a positivist conception of epistemic humility.

A second 19th century development, also sympathetic to science, is pragmatism, especially as developed by Charles Sanders Peirce. It is ‘certainly best’ if our beliefs are suitably ‘fixed’, against the ‘irritation of doubt’, so that they can ‘truly guide our actions’ and so ‘satisfy our desires’. Since our actions and beliefs are situated within a social world, Peirce characterises ‘inquiry’ in terms of social-epistemic practices for the ‘fixation of belief’, of which, in the modern world, science evidently claims ‘the most wonderful triumphs in the way of settling opinion’ (1992, 114, 120). Yet the main object of deep confidence is not science, but *logic*, defined as the ‘art of reasoning’, able to critically ‘fix’ beliefs. But such ‘logicality’ cannot be confined to solitary thinkers, lest criticism become ‘endless’, perpetuating doubt. Peirce therefore urges deep confidence in ‘logicality’, on condition that it ‘must embrace the whole community’, since public systems of critical discourse provide checks unavailable to isolated reasoning. Confidence in science is justified by virtue of its status, within modern society, as the best available means for realising the ideal of ‘logicality’ embedded in a ‘whole community’ (1992, 149). A further object of deep confidence is Peirce’s vision of the ‘conception of reality’ that will emerge as ‘the ultimate result of inquiry’. The ‘social principle … rooted intrinsically in logic’ is therefore related to a broader epistemic ambition of the convergence of socialised, ‘logical’ inquiry (1998, 149).

The cases of positivism and pragmatism indicate forms of deep confidence in the social and epistemic fruits of science familiar to later audiences. But other 19th century philosophies have very different tastes – systematic and metaphysical in a way that later thinkers find exotic or grandiose. The ‘synthetic’ philosophy of Herbert Spencer, a giant of Victorian intellectual life, aspired to provide a ‘statement of the ultimate principles discernible throughout all manifestations of the Absolute’. An evolutionary current flows through Spencer’s vision of a metaphysical reality, manifesting itself at every level of reality – inorganic, organic, and ‘super-organic’, or sociopolitical – according to a law of ‘evolution and dissolution’. Landscapes, creatures, societies, and systems of ideas gradually move from ‘confused simplicity’ to ‘distinct complexity’, as described by the various special sciences (1867, xi, 438). Biology and history, for instance, articulate particular manifestations of this cosmic law – the evolution of creatures from simple to complex forms, say, or of societies from the ‘primitive’ to the technological.

Spencer’s deep confidence was in social and moral progress, guaranteed by our increasingly sophisticated understanding of the ‘law of evolution and dissolution’, through ‘synthetic’ philosophy. The culmination is modern liberal and technological cultures, like ours, that represent the most advanced realisation of the values of liberality and individualism. But Spencer places strict limits on the depth of our epistemic confidence: since the special sciences focus on specific principles and phenomena, the Absolute necessarily ‘transcends’ both our ‘knowledge [and] conception’. Attempts to investigate it will find us ‘continually thrown back’, forcing a humbling, ‘deepened conviction’ that understanding the Absolute is an ‘impossibility’ – indeed, it is, therefore, also ‘the Unknowable’. This rules out the possibility of deep confidence in the knowability of the nature of reality, something that Spencer is happy to accept. ‘Our duty’ is to conduct ourselves, ‘with all humility’, according to the ‘established limits of our intelligence’ – relative to the Unknowable – and failure to do so constitutes ‘radical vice’ (1867, ix, 545, 113, 108).

These 19th centuries philosophies went on to enjoy very different fortunes. Positivism and pragmatism resonated within a culture defined by the sciences and so fared well into the 20th century. But Spencer’s ‘synthetic’ philosophy, with its brooding talk of the ‘Unknowable’, sat badly within an increasingly epistemically confident culture. The result was the entrenchment, by at least the late 1860s, of a set of visions of our epistemic situation within the wider order of things that encouraged a deep epistemic confidence. Such confidence manifested itself in the ambitions that were increasingly embraced by the representatives of leading currents in philosophy and science – a newly ambitious spirit that was most vividly clear in the writings of a group now known as the scientific naturalists.

**5. Scientific naturalism and ‘institutionalised humility’**

Conceptions of epistemic humility are defined relative to background metaphysical visions or worldviews. As objects of deep confidence change, so do prevailing ideas of what constitutes epistemically humble conduct. The striking epistemic confidence of 19th century European culture was a product of many factors, not least the rapid development of science. Indeed, by the 1870s, an increasingly robust confidence in science was being championed by a group of mainly British scientists, educators, and writers – advocates of a new picture of the world, to be provided by science and made the basis of significant educational and social reform (see Barton 1998).

Perhaps the most vociferous of the ‘scientific naturalists’ was T.H. Huxley – biologist and, later, ‘Darwin’s bulldog’ – who declared that ‘the order of nature is ascertainable by our faculties to an extent which is practically unlimited’, specifically through scientific methods, hence the need for a ‘complete and thorough scientific culture’ (1872, 145, 62). A few decades earlier, such confidence could only have seemed exaggerated and hubristic, but a new confidence in scientific enquiry made such proclamations not only acceptable, but, increasingly, compelling. W.K. Clifford, best known today for an essay on the ethics of belief, similarly insisted that there is, ‘to every reasonable question’, an ‘intelligible answer’, which ‘either we or posterity may know through the exercise of scientific thought’. Since intelligible, reasonable enquiry is confined to those trained in scientific ‘frames of mind’, all else is derided as ‘superstition’. Such willingness to assign to science an exclusive responsibility for all ‘reasonable’ enquiry is a clear mark of Clifford’s deep confidence in the picture of the world it has a privileged power to render ‘intelligible’ (1879, 155).

If critics worried about a lack of humility in these claims, then ones by other scientific naturalists seemed even more hubristic. In the provocative ‘Belfast Address’, John Tyndall called for all ‘religious theories, schemes, and systems’ aspiring to ‘cosmogony’ to ‘submit to [science’s] control’. To achieve, this, a ‘purely scientific’ education is needed, to propagate scientific habits of thought, albeit ones sensitive to the ‘Power which gives fullness and tone’ to our existence – a sort of naturalistic, ‘higher pantheism’ (1874, 61, 36, 65). Such Romantic talk of a ‘Power’ fades, however, from the later scientific naturalistic writings. Karl Pearson, writing at the very end of the century, confidently dismissed Kant’s and Spencer’s talk of unknowable things-in-themselves as ‘futile’, insisting that science is ‘daily subduing’ the remaining ‘mysteries’ of the world. But that is no loss, for what is ‘essential to good citizenship’ is not religious mystery, but only the ideal of the ‘scientific man’, ‘striv[ing] for self-elimination’, humble and unselfish (1892, 72, 112). By the end of the 19th century, what counts as epistemic humility was being redefined: where once it entailed strict limits on human epistemic powers, now it was judged to be compatible with grand ambitions to know the order of reality – a depth of epistemic ambition that Spencer, and others would have rebuked as ‘dogmatic’ vice.

I argued that an epistemically humble person regulates their conduct, including their assertions and ambitions. But those of the scientific naturalists were hugely confident, even hubristic – as when Tyndall declares the ‘impregnable position’ of science (1897, 520) –even as they asserted their *humility*. Indeed, their writings are suffused with sincere professions of acute epistemic humility. Despite his bullishness, Huxley lauds scientists for their willingness to ‘sit down before the facts’, forsaking pride to ‘give up every preconceived notion’, and so ‘follow humbly’, like ‘a little child’ (1913, 235). Tyndall described a ‘condition of success’ in science as the ‘willingness to abandon all preconceived notions’, a spirit of ‘self-renunciation’ that characterises an ‘earnest prosecutor of science’ who has attained ‘humility’ (1867, 72, 73). Of course, such professions were not confined to scientific naturalists—Peirce also takes humility as the virtue of scientists who must foreswear ‘presumptive choice of hypotheses’, ‘prefer the truth to their own interest’, and so on – ‘a true elevation of the soul’ (1974, 314).

How could the scientific naturalists profess humility while simultaneously embracing such deeply, even hubristically, confident ambitions? Answering this requires appeal to the call for conceptions of humility to be understood relative to a metaphysical vision. It became popular, in the 19th and 20th centuries, to perceive science as (in my terminology) the best means for systematically fulfilling confidence conditions – the confidence of agents in their trained epistemic capacities, say, or confidence in collectively organised communities of enquiry. Starting at the agential level, a trainee scientist gains new skills, knowledge, and self-trust by undergoing specialist training. The modern infrastructure of scientific education and apprenticeship enable agents to build up their confidence in themselves as epistemic agents – that being the first ‘level’ of humility. Moving to the collective level, the scientific establishment is a powerful infrastructure apt for shared enquiry: a complex structure of disciplines, material cultures, investigative technologies – a realisation of Huxley’s vision of a collective ‘reservoir of ascertained truth’ (1893, 254), vindicating Peirce’s faith in ‘logicality’, expressed across a ‘whole community’ (1986, 284). An acute sense of epistemic humility is therefore justified by science’s distinctive status as an exemplar of what the sociologist of science Robert Merton called ‘institutional humility’ (1957, 646).

This explanation of the tension between the confidence and humility of the scientific naturalists runs into an obvious problem. It applies only to agential and collective confidence and so presupposes that deep confidence in science and its governing picture of the world is already warranted. If that picture is hubristic, then so are the ambitions and attitudes rooted in it. So, did the scientific naturalists warrant their picture of the world?

**6. Humility, hubris, and ‘pictures of the world’**

The question of whether the scientific naturalists were humble or hubristic depends on their warrant for the picture of the world in terms of which they measured their confidence. I want to suggest that they not only did not, but could not, warrant that picture: therefore appraisals of their virtuous or vicious character are significantly complicated.

Despite their deep confidence in the naturalistic picture of the world, the naturalists failed to provide compelling arguments in support of its truth. Huxley vigorously attacked forms of ‘speculative philosophy’ for relying on empirically unprovable claims. But he then cheerfully concedes that the ‘postulates’ of physical science, such as invariant, universal laws of nature, are ‘neither self-evident nor … demonstrable’ (1894, 61). Similarly, Tyndall candidly admits that science ultimately derives its ‘motive force’ from an ‘ultra-scientific source’. This ‘source’ is an ‘intellectual vision’ that has ‘feeling, not knowledge, for its base’, including a vivid sense of the ‘mystery of man’s relation to the universe’ (1870, 65 and ‘Explanatory Note’). Confidence in a naturalistic picture of the world ultimately requires a process of conversion, rather than the provision of evidence or reasons.

A critic might reply that the rationality of that picture of the world can at the least be secured by the critical rejection of its rivals. Even if naturalists cannot prove their picture to be a true one, they can at least remove any alternatives through reasoned critique. But their writings unfortunately show little evidence of such critical efforts. Although rival visions are consistently acknowledged, they are usually either derogated – as ‘speculative’, say – or else passed over. Tyndall surveys several rival visions of the world, mainly various brands of German Idealism, that would check his deep confidence in science. But his only response is a breezy admission that it is ‘by no means easy to combat such notions’ (1874, 57). Similarly, Huxley chides Kant for failing to grasp that ‘the laboratory is the fore-court of the temple of philosophy’. But this ignores the transcendental idealist strictures on the epistemic status of sense-experience (1971, 166). Although Kant’s epistemological doctrines should not be accepted dogmatically, it was as reasonable then as now to expect Huxley to have provided arguments against them, rather than opting to beg the question against them.

Such failures make the professed humility of the scientific naturalists suspect. A virtuously humble person takes care to regulate their confidence by modifying their claims in the light of just criticisms and rival claims. Such well-regulated confidence seems not to be in evidence among these 19th century scientific naturalists; indeed, underlying their writings is – as George Levine (2014, 79) says of the Belfast Address – a ‘supreme confidence joined to a sense of righteous superiority’. The story of how the scientific naturalists came to successfully entrench their ‘intellectual vision’ was, as Matthew Stanley documents, due not to successful argumentation against rivals, but to their ‘taking control of scientific education in Britain’, ‘naturalising theistic concepts’, and serendipitous ‘shifts in religious life’. Indeed, so successful were these strategies, that, by the early 20th century, naturalism had come to seem ‘obvious and inevitable’, fuelling a potent ‘confidence’ that ‘scientific exploration’ could successfully challenge all ‘current unknowns’ (2014, 243, 248, 266). Can we therefore charge them with *epistemic hubris*, the vice of those whose radical confidence not only *is* not, but *can* not, be warranted?

I suggest that there is no easy answer to that question. A clue to the reason for this is Tyndall’s remark that, ultimately, confidence in science is rooted in an ‘intellectual vision’ - a picture or worldview. Considered relative to that vision, claims about the profound epistemic power of science are not hubristic, for the only obstacles to a description of reality are ones of time, energy, and investment, of a sort that the emerging scientific culture will vouchsafe. If so, hubris takes different forms than it would for those, like Kant or Spencer, whose visions of the world incorporate ineliminable constraints on deep confidence in science (for instance, there can be no science of ‘the Unknowable’). We can only discuss epistemic humility and hubris with careful reference to the background metaphysical visions against which the nature and limits of our epistemic capacities are to be measured. There is no neutral conception of our epistemic situation within the world to which to appeal to judge what the putatively objective limits of our epistemic powers are – so perhaps the best that we can do is to carefully describe the background visions against which a given community made its judgments.

It is clear that, by the late 19th century, a scientific picture of the world was rapidly being entrenched, altering the sorts of deep confidence judged to be plausible and compelling. But its entrenchment was not a universal feature of all European cultures: while that picture quickly took hold in energetically industrial countries, like Germany and Great Britain, the situation was different elsewhere. In France, for instance, a vigorous discourse affirming the ‘bankruptcy of science’ emerged during the 1870s, motivated by a diverse set of worries—‘a romantic reaction against industrialism’, ‘defence of traditional educational values’, and acute criticisms of science’s failure to promote material wellbeing while risking the erosion of ‘the ethical framework upon which European civilization rested’ (MacLeod 1982, 2). While across the Channel, British scientific naturalists were rhapsodising about the ceaseless merits of science’s intellectual and social vision, French academics were warning that if science had not yet ‘plunged into total bankruptcy’, then it had ‘at least had its credit shaken by its considerable failures’ (Paul 1968, 306). Charting the emergence and diffusion of the cultural and intellectual developments that affected deep confidence in science must encompass careful historical analysis, of the sort begun by Richard Olson in his 2008 book, *Science and Scientism in Nineteenth-century Europe*.

Subsequent cultural and intellectual history was, of course, to witness the generally successful entrenchment of deep confidence in science as a privileged, progressive source of social advance and descriptions of the ultimate nature of reality. It is no coincidence that, by the late 19th century, rival visions less sympathetic to deep confidence in science either died out – as British and German Idealism did – or were radically amended, as when the neo-Kantians abandoned the core doctrine of unknowable things-in-themselves. In the course of the 20th century, critical reactions against science continued, motivated by various philosophical, political, and cultural concerns and developments – postpostivist philosophies of science, feminist and postcolonial critiques, contemporary resistances to sciences judged to conflict with religious values, among others. All of these testify to historical patterns or rhythms to changes in conceptions of our epistemic situation and of the wider nature of reality, that play out, among other things, in the definition of what counts as epistemically humble or hubristic conduct and enquiry.

Certainly the idea that conceptions of epistemic humility are indexed to metaphysical visions becomes a theme of much of *fin-de-siècle* philosophical culture. In the early decades of the twentieth century, many of the main philosophical movements, especially phenomenology, began to argue that our experience and enquiry ultimately presupposes conditions of possibility that cannot be justified – ‘ways of being in the world’, a ‘life-world’, and so on. Such claims incorporated latent doctrines of humility, for they impose strict constraints on the scope and strength of our epistemic capacities. But it is in the later writings of another philosopher, Ludwig Wittgenstein, that these thoughts find their fullest expression. Reflecting on the increasingly confident scientistic culture that was developing around the 1920s, Wittgenstein began to argue that science presupposes a *Weltbild*, a ‘world-picture’, the ‘inherited background’ that acts as the ‘matter-of-course foundation’ for our practices of ‘enquiring and asserting’, against which we ‘distinguish true and false’. But a picture cannot, argued Wittgenstein, be proven or refuted, since any practices or criteria of proof and refutation would be drawn from the very picture whose legitimacy is being questioned (1967, §§94, 167; see Cooper 2017). Such remarks suggest that the most we can do is describe the naturalists’ picture of the world and ask whether it is justified on its own terms, or confining criticism to other criteria – moral, say (see Kidd 2017). As Edward Craig puts it, a *Weltbild* – defined as a ‘very general picture of the real’ – can at best be ‘articulated’, by describing historically and philosophically its origins and development, but not definitively ‘proven’ (1987, 2).

It is not necessary to take a stand on these philosophical issues to appreciate that they reflect a new sort of epistemic humility. This new sort was rooted in anxieties about the possibility of justifying the very deep confidence in the scientific picture of the world that we have inherited, a set of anxieties that was the product of a particular and contingent cultural and intellectual history. In the course of that history, the concept of epistemic humility and its status as a virtue has changed, often quite dramatically, and continues to do so, so the historical story is on-going (and a very rich account of the history of epistemic humility is offered by Cooper 2002, chs.2-6).

**Conclusions**

This chapter aimed to show that at least some epistemic virtues and vices must be conceived with reference to changing background conceptions of the nature of reality, and sketched an account of a recent episode in the history of one such virtue: ‘epistemic humility’. That history continued, of course, throughout the 20th century, when debates about epistemic confidence in science continued unabated. Certain forms of constraint on that deep confidence were to fade away, even as others appeared to take their place. Few scientific realists today worry about postlapsarian limits to deep confidence in science, but instead reflect on the epistemic implications of its historical contingency (Kidd 2016b). Is talk of a comprehensive scientific description of the world impossibly hubristic, or an ambition compatible with a real sense of epistemic humility? If I am right, this is a debate about the conceptions of humility available in cultures where a naturalistic picture of the world prevails. But that is another episode in the history of the virtue of epistemic humility in science for another time.

**Acknowledgements**

I am grateful to Chiara Ambrosio, David E. Cooper, colleagues at Durham, the Editors, and the participants at the conference from which this volume emerged for helpful comments, encouragement, and discussion.

**References**

Barton, Ruth. 1998. “Huxley, Lubbock, and half a dozen others”: Professionals and gentlemen in the formation of the X Club, 1851-1864. *Isis* 89.3: 410-444.

Blumenberg, Hans. 1983. *The legitimacy of the modern age*. Cambridge, Mass.: MIT Press.

Clifford, William Kingdon. 1879. *Lectures and essays*, vol. 1, eds. Leslie Stephen and Frederick Pollard. London: Macmillan and Co.

Comte, Auguste. 1988. *Introduction to positive philosophy*, ed. and trans. Frederick Ferré. Indianapolis: Hackett.

Cooper, David E. 2002. *The measure of things: Humanism, humility, and mystery*. Oxford: Clarendon Press.

\_\_\_\_\_. 2017. Superstition, science, and life. In *Wittgenstein and scientism*, ed. Jonathan Beale and Ian James Kidd; 28-28. New York: Routledge.

Corneanu, Sorana. 2011. *Regimens of the mind: Boyle, Locke, and the early modern* cultura animi *tradition.* Chicago: University of Chicago Press.

Craig, Edward. 1987. *The mind of God and the works of man*. Oxford: Clarendon Press.

Daston, Lorraine and Peter Galison. 2007. *Objectivity.* New York: Zone Books.

Harrison, Peter. 2007. *The fall of man and the foundations of science*. Cambridge: Cambridge University Press.

Huxley, Thomas Henry. 1872. *Lay sermons, addresses, and reviews.* New York: D. Applegate and Company.

Huxley, Thomas Henry. 1893. *Essays*. London: Macmillan.

\_\_\_\_\_. 1894. *Methods and results: Essays.* London: Macmillan and Co.

\_\_\_\_\_. 1913. *Life and letters of Thomas Henry Huxley*, vol. 1, edited by Leonard Huxley. London: Macmillan and Company.

\_\_\_\_\_. 1971. *T.H. Huxley on education: A selection from his writings*, ed. Cyril Bibby. Cambridge: Cambridge University Press.

Kidd, Ian James. 2015. Educating for intellectual humility. In *Intellectual virtues and education: Essays in applied virtue epistemology*, ed. Jason Baehr; 54-70. London: Routledge.

\_\_\_\_\_. 2016a. Intellectual humility, confidence, and argumentation. *Topoi* 35: 395-402.

\_\_\_\_\_. 2016b. Inevitability, contingency, and epistemic humility. *Studies in History and Philosophy of Science* 55: 12-19.

\_\_\_\_\_. 2017a. Reawakening to wonder: Wittgenstein, Feyerabend, and scientism. In *Wittgenstein and scientism,* eds*.* Jonathan Beale and Ian James Kidd; 101-115. London: Routledge.

\_\_\_\_\_. MS. Deep conceptions of epistemic vice. Unpublished paper.

Levine, George. 2014. Paradox: The art of scientific naturalism. In *Victorian scientific naturalism: Community, identity, continuity*, eds. Bernard Lightman and Gowan Dawson; 79-100.Chicago: University of Chicago Press.

Lloyd, Genevieve. 2000. Feminism in history of philosophy: Appropriating the past. In *The Cambridge companion to feminism in philosophy*, eds. Miranda Fricker and Jennifer Hornsby; 245-263. Cambridge: Cambridge University Press.

Macleod, Roy. 1982. The ‘bankruptcy of science’ debate: The creed of science and its critics, 1885-1900. *Science, Technology, and Human Values* 7.41: 2-15.

Merton, Robert. 1957. Priorities in scientific discovery: A chapter in the sociology of science. *American Sociological Review* 22.6: 635-659.

Montaigne, Michel de. 1991. *Essays*, ed. and trans. M.A. Screech. London: Penguin.

Olson, Richard. 208. *Science and scientism in nineteenth-century Europe*. Urbana and Chicago: University of Illinois Press.

Pardue, Stephen T. 2013. *The mind of Christ: Humility and the intellect in early Christian theology.* London: Bloomsbury.

Paul, Harry W. 1968. The debate over the bankruptcy of science in 1895. *French Historical Studies* 5.3: 299-327.

Peirce, Charles Sanders. 1974. *Collected papers*, 2 vols., eds. Charles Hartshorne and Paul Weiss. Cambridge, Mass.: The Belknap Press of Harvard University Press.

\_\_\_\_\_. 1986. *Writings of C.S. Peirce: A chronological edition: vol. 3. 1872-1878.*Bloomington: Indiana University Press.

\_\_\_\_\_. 1992. *The essential Peirce: Selected philosophical writings: vol. 1*, *1867-1893*, edited by Nathan Houser and Christian Kloesel. Bloomington: Indiana University Press.

\_\_\_\_\_. 1998. *The essential Peirce: Selected philosophical writings: vol. 2*, *1893-1913*, edited by the Peirce Edition Project. Bloomington: Indiana University Press.

Roberts, Robert C. and W. Jay Wood. 2007. *Intellectual virtues: An essay in regulative epistemology*. Oxford: Oxford University Press.

Shapin, Steven. 2008. *The scientific life: A moral history of a late modern vocation.* Chicago: The University of Chicago Press.

Spencer, Herbert. 1867. *First principles*. London: Williams and Norgate.

Stanley, Matthew. 2014. *Huxley’s church and Maxwell’s demon: From theistic science to naturalistic science*. Chicago: The University of Chicago Press.

Tyndall, John. 1867. On the study of physics. In *The culture demanded by modern life: A series of addresses and arguments on the claims of scientific education*, ed. Anon. New York: D. Appleton and Company.

\_\_\_\_\_. 1874. *Address delivered before the British Association Assembled at Belfast.* London: Green and Co.

\_\_\_\_\_. 1897. *Fragments of science: A series of detached essays, addresses, and reviews*, vol. 1. New York: D. Appleton and Company.

Wittgenstein, Ludwig. 1967. *On certainty*, ed. G.E.M. Anscombe and G.H. von Wright. Trans. Dennis Paul and G.E.M. Anscombe. Oxford: Basil Blackwell.

Zagzebski, Linda. 1996. *Virtues of the Mind: An Inquiry into the Nature of Knowledge and the Ethical Foundations of Knowledge*. Cambridge: Cambridge University Press.