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**The problem of disenchantment: scientific naturalism and esoteric discourse, 1900-1939**

Asprem, E.

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## Science as Worldview

No, Thérèse, no, there is no God, Nature sufficeth unto herself; in no wise hath she need of an author; once supposed, that author is naught but a decayed version of herself, is merely what we describe in school by the phrase, a begging of the question.

Marquis de Sade, *Justine, or Good Conduct Well Chastised*, 496.

### INTRODUCTION

The problem of disenchantment concerns above all the relation between science and worldviews. As seen in chapter one, Weber's starting point had been that scientific knowledge about the world could never tell anyone how to live or what to value. In a disenchanted world science had complete authority as far as knowledge about nature was concerned, but nature did not conceal any secrets of an ethical or religious character that could be revealed and understood through discovery. Science and worldview were therefore entirely separated domains. Such an absolute breach between science and its worldview implications has, however, often been ignored in practice. Speculations about the worldview implications of science have generated a voluminous literature, with contributions from both contenders and contesters of science. By reconceptualising disenchantment as a problem rather than a process we can include all these voices and analyse how they take part in broader struggles to make sense of life in the modern world.

The revisionism implicit in this move does not come without its challenges, however, and the present chapter is designed to sort out the most difficult ones. Above all, we get into a perilous terrain between philosophy of science and historical research: what are the implications of dismissing Weber's disenchantment thesis as (epistemologically) normative, and reducing his position to one among a number of competing claims about the reach of science and its relation to the domain of religion, meaning, and metaphysics? Do we automatically have to side with a presumably

“oppressed” intellectual current of “re-enchantment”, against a presumably oppressive disenchanted establishment? Or does the alternative of stressing dialogue, negotiation, and struggle between situated individuals on all sides force us into a position of complete epistemological relativism that ultimately backfires on the very attempt to write an academic commentary that must presume to judge some historical narratives right and others wrong? In short: can we proceed without being devoured either by the Scylla of an activist emancipationism (advocating “suppressed knowledge”) or the Charybdis of a self-defeating relativism? I shall argue that we can avoid both, but that we must take the problems seriously.

In the first part of this chapter, I will discuss some central works of what might be called the “re-enchantment paradigm” in the history of science.<sup>1</sup> My intention should be crystal clear from the outset: one ought to be suspicious whenever references to a “re-enchantment” of science are made. I will argue that the re-enchantment paradigm is troubled by analytical poverty, driven by heavy ideological bias, and is demonstrably untenable from a historical point of view. If matters were somewhat simplified by Weber’s original thesis, they have become entirely muddled in the writings of a generation of post-war academic activists fighting what they have understood as systemic evils of modernity in which “science” played a major, yet nebulous, role. I hold that the perspectives of key authors belonging to this broader landscape of postmodern science criticism are in fact to be seen as part of the very emic discourses that form the subject matter of the present study: they are late responses to the “problem of disenchantment”, following in the footsteps of some of the voices of the early 20<sup>th</sup>-century that we will be discussing in later chapters of this book.

Having identified the weaknesses of the re-enchantment paradigm, I will turn to a more constructive path. In the last parts of this chapter, attention is turned to another term that has been tied to the notion of “scientific worldviews”: that of *scientific naturalism*. I will provide a brief historical and philosophical introduction to scientific naturalism, which together will serve two related purposes. From a historical perspective, I argue that scientific naturalism constituted a potent intellectual movement at the turn of the century that, although it may later have given rise to certain stereotypes about science that have inspired the polemical uses of

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<sup>1</sup> E.g. Morris Berman, *The Reenchantment of the World*; David Ray Griffin (ed.), *The Reenchantment of Science*.

“disenchantment”, was actually at odds with some of the main dimensions of Weberian disenchantment. By comparing the philosophical attitudes of naturalism to the dimensions of disenchantment, we see that naturalism has always carried in it a potential for challenging the would-be disenchantment of the world. Notably, scientific naturalism refused to accept the intellectual sacrifice, seeking on the contrary to ground worldviews in science and natural knowledge. From a historical perspective, then, scientific naturalism shows us that leading intellectuals at the dawn of the 20<sup>th</sup> century solved the problem of disenchantment in rather different ways than what Weber would have deemed to be legitimate. In this sense, naturalism provides an essential intellectual context for broader philosophical concerns about science. It provided an alternative to the neo-Kantian perspective on which the disenchantment thesis was built. This point sets the stage for my overall argument throughout this book: contradictory responses to the problem of disenchantment reflect competing visions of the nature of the scientific enterprise itself.

I shall, however, take my focus on naturalism one step further. I will refer to naturalism not only to broaden the philosophical context of early 20<sup>th</sup> century science, but will also use it to inform my own methodological position in order to avoid the epistemological quagmire of relativism. I shall argue that a form of *methodological naturalism* offers the best framework for appreciating the variety of historical responses to the problem of disenchantment without succumbing to partisanism or relativism. As we shall see, naturalism is strongly *a posterioristic*: all knowledge is in principle open for revision – including the very epistemological and methodological principles by which knowledge itself is produced and justified. This means that naturalism is an underestimated ally of social constructionism: naturalism is entirely compatible with reconstructing the ways people have thought about the world in any given period, based on the canons of reason and evidence then in currency, without thereby jumping to the conclusion that “anything goes”. Even if standards of rationality are liable to change from one historical context to another, and even if the actual, practical relevance of such standards is always dependent on social, cultural, and individual factors, epistemological standards and assumptions are still there as important parts of knowledge-building in any given context. It remains the case that certain knowledge claims will always be easier to make in given contexts than others, and that certain styles of argumentation will seem more persuasive than others. From a

naturalistic perspective, furthermore, such ever-changing codes of rationality are ultimately constrained by pre-discursive reality – including by the mental and cognitive capacities of human beings and by the natural environments in which they live.

These concerns are not of “purely theoretical” interest – they are of great importance for the argumentation developed in this book as a whole. One central argument is, for example, that struggles with the problem of disenchantment in the early 20<sup>th</sup> century must be understood in the context of changing scientific plausibility structures. The clearest example is found in the history of parapsychology, discussed at length in part three: the acceptance and rejection of parapsychology as a discipline can only be understood in the context of changing standards for scientific research, as well as changing interests in particular theoretical frameworks. Basing my approach on a methodological naturalism that does not rest on any *a priori* foundationalism about “right” academic conduct, but rather acknowledges the dynamic and changing nature of scientific “consensus”, makes it possible to study and appreciate the diversity of superseded scientific cultures without losing sight of the standards that we must respect today if we do not want to lose our intellectual integrity. This, I believe, makes it possible to strike a balance between present-centeredness and relativism, and thus to shed light not only on the “external” social and cultural reasons for the successes and failures of specific research programmes, but on “internal” factors concerning the rationality of discovery and justification as well. The latter dimension can only be evaluated if we assume that there are “natural” and invariable constraints on processes of knowledge-building, and that our present scientific knowledge can shed light on how those natural invariables have determined the course of knowledge-cultures of the past.<sup>2</sup>

### **1 THE POVERTY OF THE RE-ENCHANTMENT PARADIGM**

In the late 1970s, amidst growing concern about environmental destruction and the threat of nuclear war, Weber’s prophecy about “the fate of our times” came to be reinterpreted in entirely alarmist terms. Certain critics now came to see disenchantment as the grim fate of modern civilisation. In a politicised and spiritually

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<sup>2</sup> In so doing I seek to follow the middle ground between “constructionism” and “realism” about science as argued by Philip Kitcher, ‘A Plea for Science Studies’.

charged manner, they embraced a call for the *re-enchantment* of the world and of science. Assuming that the world had truly been disenchanted by a science that was “reductionist”, “materialist”, and “mechanistic”, these scholar-activists would paint a dystopian view of the present that was furthermore used as a springboard for revisionist historiography. In the present section I will introduce and criticise the “re-enchantment paradigm” that arose in this context, exemplified by two of its strongest academic proponents. My central argument is that the re-enchantment paradigm, despite being expounded by academics and published in books on major university presses, should be considered part of the object of study rather than contributions to the field of scholarly analysis that I seek to develop here.

Morris Berman’s *The Reenchantment of the World* (1981) seems to have set the stage for the re-enchantment paradigm. A PhD in the history of science from John Hopkins University and the author of an important work on the Royal Institution (*Social Change and Scientific Organization*, 1978), Berman would later use the history of science in a cultural struggle against what he saw as serious problems with modern society at large. His first book already included a distinctly critical perspective on the development of a utilitarian and instrumentalist ideology in the Royal Institution through the 19<sup>th</sup> century. In *The Reenchantment of the World*, however, the trends Berman had seen in this scientific organisation were only early symptoms of a cultural disease that had since infected the whole of modern society. The diagnosis was severe indeed, and Berman’s formulations were coloured by the characteristic contempt of the moral entrepreneur:<sup>3</sup>

The alienation and futility that characterized the perceptions of a handful of intellectuals at the beginning of the century have come to characterize the consciousness of the common man at its end. Jobs are stupefying, relationships vapid and transient, the arena of politics absurd. In the vacuum created by the collapse of traditional values, we have hysterical evangelical revivals, mass conversions to the Church of the Reverend Moon, and a general retreat into the oblivion provided by drugs, television, and tranquilizers. We also have a desperate search for therapy, by now a national obsession, as millions of Americans try to reconstruct their lives amidst a pervasive feeling of anomie and cultural disintegration.<sup>4</sup>

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<sup>3</sup> For the concept of moral entrepreneurship, see Howard Becker, *Outsiders*.

<sup>4</sup> Berman, *The Reenchantment of the World*, 17.

Berman's diagnosis is one of degeneration, collapse, and crisis, echoing typically anti-modernist views of the "shallowness" of modern life and the loss of meaning and 'traditional values'. These, of course, were extrapolations from the disenchantment thesis: a growth in scientific rationality had come at the expense of "values" and "meaning". As Berman explained in the introduction to the book, the rationale for writing it had appeared when the author realised that something was missing from his more strictly academic (but still rather polemical) *Social Change and Scientific Organization*. In that book, Berman had been able 'only to hint at some of the problems that characterize life in the Western industrial nations' that he found 'profoundly disturbing'.<sup>5</sup> Seeking an explanation of these disturbing aspects of modern life a change in perspective was needed:

I began that study in the belief that the roots of our dilemma were social and economic in nature; by the time I had completed it, I was convinced that I had omitted a whole epistemological dimension. *I began to feel, in other words, that something was wrong with our entire world view.* Western life seems to be drifting towards increasing entropy, economic and technological chaos, ecological disaster, and ultimately, psychic dismemberment and disintegration; and I have come to doubt that sociology and economics can by themselves generate an adequate explanation for such a state of affairs.<sup>6</sup>

Leaving strictly socio-economic analysis behind, Berman had now decided to take on a much more ambitious project: 'to grasp the modern era, from the sixteenth century to the present, as a whole, and to come to terms with the metaphysical presuppositions that define this period'.<sup>7</sup> In contrast to the principle of methodological individualism that was discussed in the previous chapter, Berman's is a pure example of an idealistic and totalising narrative where the agency of individual actors is ignored all together and subsumed under a strangely deterministic notion of abstract processes and ideological constrains directing history and society. Much in parallel to Marxist analyses, such immensely powerful structural forces can only be countered by concerted revolutionary action, in which entire populations subject themselves to the goals of a common will.

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<sup>5</sup> Ibid., 15.

<sup>6</sup> Ibid. Emphasis added.

<sup>7</sup> Ibid., 16.

One advantage of top-down structural analyses of this kind is that they are fairly easy to summarise. In Berman's case, the whole narrative is based on dichotomies that serve clearly polemical and evaluative ends: the faults of modernity are due primarily to 'the split between fact and value', and the distinction between subject and object. To frame these relations historically, Berman significantly employs an operative distinction between "enchantment" and "disenchantment," between "modern" and "pre-modern", and even between the "modern" and the "traditional".<sup>8</sup>

The problems Berman are concerned with – which we now recognise as nothing but the problem of disenchantment itself – began with the scientific revolution and the emergence of the "mechanical philosophy". Before the scientific revolution, an "enchanted" view of nature had still predominated. In Berman's own terminology, Western pre-modern civilisation had rested on a 'participating consciousness' that involved 'merger, or identification, with one's surroundings, and bespoke a psychic wholeness that has long since passed from the scene'.<sup>9</sup> By contrast, the mechanical philosophy had brought about 'disenchantment' and 'non-participation'. These are the symptoms of what Berman with a supremely simplistic (yet predictable) generalisation calls 'the Cartesian paradigm'.<sup>10</sup>

The political implications – or perhaps premises – of these statements are obvious. Indeed, the historical part of Berman's argument works to support an explicitly speculative part on 'Tomorrow's Metaphysics' and 'The Politics of Consciousness'.<sup>11</sup> The assumption is that, since the cause of modernity's malaise is found in a certain disenchanted *mentality* based on the mechanistic philosophy, a new type of metaphysics must be part of the remedy. This metaphysical cure must involve a 'reenchantment of the world':

For more than 99 percent of human history, the world was enchanted and man saw himself as an integral part of it. The complete reversal of this perception in a mere four hundred

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<sup>8</sup> Ibid., 16-17.

<sup>9</sup> Ibid., 16. Here he echoes the theory of Lucien Lévy-Bruhl about the "savage mind" as resting upon a logic of "participation". Curiously, Berman takes it in a much more essentialist direction than Lévy-Bruhl himself ever did when he stresses that this mode of cognition has disappeared completely. See Lévy-Bruhl, *Le mentalité primitive*; cf. Hanegraaff, 'How Magic Survived the Disenchantment of the World'.

<sup>10</sup> Ibid., 24.

<sup>11</sup> E.g., *ibid.*, 133-152, 191-299.



years or so has destroyed the continuity of the human experience and the integrity of the human psyche. It has very nearly wrecked the planet as well. The only hope, or so it seems to me, lies in a reenchantment of the world.<sup>12</sup>

Berman is, however, painfully aware that a return to the past is simply not possible. The unspoiled, pristine, enchanted world of early- or pre-modern Europe is long since gone, and its views on nature are not likely to return. “Traditional values” cannot organically re-emerge from the new conditions of social life either; it all belongs to a past that is lost forever. The relation between past, future, and a troubled present thus becomes the ‘crux of the modern dilemma’:

We cannot go back to alchemy or animism – at least that does not seem likely; but the alternative is the grim, scientific, totally controlled world of nuclear reactors, microprocessors, and genetic engineering – a world that is virtually upon us already. *Some* type of holistic, or participating, consciousness and a corresponding sociopolitical formation have to emerge if we are to survive as a species. At this point ... it is not at all evident what this change will involve; but the implication is that a way of life is slowly coming into being which will be vastly different from the epoch that has so deeply colored, in fact created, the details of our lives.<sup>13</sup>

All of the above brings Berman’s analysis and his search for solutions very close to the type of “culture criticism” associated with the New Age literature that was emerging at the same time.<sup>14</sup> In fact, the historiography of science which Berman presents comes close to the, from a historical perspective, thoroughly discredited narrative of New Age science classics such as Fritjof Capra’s *Tao of Physics* and *The Turning Point*.<sup>15</sup> While

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<sup>12</sup> Ibid., 23.

<sup>13</sup> Ibid., 23.

<sup>14</sup> For New Age as “culture criticism”, see Hanegraaff, *New Age Religion*, 515-517. Hanegraaff emphasised that the criticism of the New Age was primarily levelled at “reductionism” and “dualism”, and that the positive programme put forward in opposition to these polemically constructed ailments was one of “holism”. As such, Berman must be seen as a central intellectual ally of New Age discourse concerning society, history, and cultural reform.

<sup>15</sup> On the questionable historiography of Capra, Ken Wilber, Theodore Roszak and other “counterculturalist” and “New Age” spokespersons, see especially John Brooke and Geoffrey Cantor, *Reconstructing Nature*, 75-105.

Berman is less interested in “oriental philosophy” than Capra was, their narratives of Western science are strikingly similar in important respects: both emphasise a “fall” connected with Cartesianism and the mechanistic philosophy.<sup>16</sup> Both, furthermore, emphasise the need for new philosophical and religious foundations for modern science, and both find some promise in certain strategically selected 20<sup>th</sup> century scientific developments – most notably quantum physics.<sup>17</sup>

Berman’s most important source for a possible new metaphysics resting on an enchanted worldview is however the later writings of the highly original scientist and anthropologist, Gregory Bateson (1904–1980). In the anthology *Steps to an Ecology of Mind* (1972), and especially in the book *Mind and Nature* (1979), Bateson presented an eclectic holistic worldview, based on concepts and insights borrowed from fields as diverse as ecology, cybernetics, evolutionary biology, thermodynamics, mathematics, psychology, and anthropology.<sup>18</sup> By the end of the 1970s, Bateson’s highly creative, supremely interdisciplinary, and equally ambitious work had become briefly, but significantly integrated at the Esalen Institute in Big Sur, California – the hub of the human potential movement and a crucial intellectual laboratory of the later New Age movement, which has had a deep impact on “self spirituality” in America and beyond.<sup>19</sup>

Using Bateson’s holism – or at least Berman’s own understanding of it<sup>20</sup> – as paradigm, Berman describes the polar difference between the ‘world view of modern

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<sup>16</sup> Compare the narrative reproduced above with Capra, *Tao of Physics*, 21-31.

<sup>17</sup> Berman makes such insinuations in the chapters ‘Prolegomena to Any Future Metaphysics’, and ‘Eros Regained’; Berman, *Reenchantment of the World*, 133-189. While Berman’s main focus is on psychology, particularly Wilhelm Reich, he does spend some time speculating on the anti-disenchantment implications of Heisenberg’s uncertainty principle (pp. 143-145). The emergence of quantum mechanics, its relation to wider cultural policies, worldviews, and revisionist histories of physics will be explored in some detail in the following chapters of part two.

<sup>18</sup> For an introduction to Bateson’s programme, one is advised to start by reading his lecture ‘Form, Substance, and Difference’, reprinted in *Steps to an Ecology of Mind*, 448-464.

<sup>19</sup> See Jeffrey Kripal, *Esalen*. For Bateson’s involvement and connections to the milieu, see especially pp. 101, 266, 306-308.

<sup>20</sup> Bateson is notoriously hard to understand, not least because of his eclectic style drawing on examples from a great number of disciplines. As Bateson wrote in 1971, this often seemed to frustrate his students who would complain that ‘Bateson knows something which he does not tell you,’ and that ‘[t]here is something behind what Bateson says, but he never says what it is.’ Bateson, ‘The Science of Mind and Order’, xvii (reprinted in *Steps to an Ecology of Mind*).

science' and a new reenchanting "Batesonian" worldview.<sup>21</sup> As is common in the genre of New Age science, the "modern scientific worldview" is presented as a conveniently caricatured straw man. "It" is presented as a homogenous, monolithic entity that is allegedly mechanistic, materialistic, and reductionist. The resulting comparison of modern science and Batesonian holism thus says very little about the material it presumes to comment upon, but a lot about the ideological underpinnings of the analysis itself. The following table gives the essentials of Berman's comparison:

**Figure 2:**

**Berman's comparison of the "Cartesian" and "Batesonian" worldviews<sup>22</sup>**

<i>Worldview of modern science</i>	<i>Worldview of Batesonian holism</i>
No relationship between fact and value.	Fact and value inseparable.
Nature is known from the outside, and phenomena are examined in abstraction from their context (the experiment).	Nature is revealed in our relations with it, and phenomena can be known only in context (participant observation).
Goal is conscious, empirical control over nature.	Unconscious mind is primary; goal is wisdom, beauty, grace.
Descriptions are abstract, mathematical; only that which can be measured is real.	Descriptions are a mixture of the abstract and the concrete; quality takes precedence over quantity.
Mind is separate from body, subject is separate from object.	Mind/body, subject/object, are each two aspects of the same process.
Linear time, infinite progress; we can in principle know all of reality.	Circuitry (single variables in the system cannot be maximised); we cannot in principle know more than a fraction of reality.
Logic is either/or; emotions are epiphenomenal.	Logic is both/and (dialectical); the heart has precise algorithms.
Atomism:	Holism:
1. Only matter and motion are real.	1. Process, form, relationship are primary.
2. The whole is nothing more than	2. Wholes have properties that parts do

<sup>21</sup> Berman, *Reenchantment of the World*, 238.

<sup>22</sup> This table of comparison has been adopted from Berman, *Reenchantment of the World*, 238.

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|----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| <p>the sum of its parts.</p> <p>3. Living systems are in principle reducible to inorganic matter; nature is ultimately dead.</p> | <p>not have.</p> <p>3. Living systems, or Minds, are not reducible to their components; nature is alive.</p> |
|----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|

We see that Berman's description of the modern scientific worldview tallies with the Weberian idea of science in a disenchanted world. The fact/value distinction has been kept as the first major point of difference between the disenchanted modern worldview and the "holistic" view, paralleling the axiological dimension of disenchantment. A stress on objectivity, measurability, empirical manipulation and control, and an extreme optimism about knowledge of the world are likewise assumptions about modern science that we recognise from the epistemological dimension of Weberian disenchantment. In Berman's comparative scheme, the re-enchanted worldview of Batesonian holism becomes a complete antithesis to disenchantment. It wants to conceive of science in terms that would have been utterly unacceptable to Weber, characteristic rather of those "swindlers and self-deceivers" who refused to undergo the intellectual sacrifice.

The contrasts portrayed by Berman significantly occlude historical realities, which are always much too complex to easily serve ideological agendas.<sup>23</sup> The description of the 'worldview of modern science' does, however, come close to certain *ideologies* of science that are often, and typically derogatorily, termed "scientism". Although there are many definitions of this term, scientism may refer to ideologies stressing the universality and objectivity of (natural) science, and wishing to expand its sphere of influence throughout society.<sup>24</sup> However, even the most fiercely scientific movements of the 19<sup>th</sup> century would typically disagree with several of the points on the left-hand side of the comparison above. For example, attempts to overcome the fact/value distinction and develop valid ethical and moral programmes based on scientific knowledge were a common trademark of 19<sup>th</sup> century ideologies of science.

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<sup>23</sup> As far as the actual scientific theories and discussions go, this point will be argued and extensively supported with references in part two.

<sup>24</sup> Here I follow the definition of scientism found in Richard Olson, *Science and Scientism in Nineteenth-Century Europe*. For other discussions of the term, see e.g. Friedrich A. Hayek, *The Counter-Revolution of Science*, 15-16; Mikael Stenmark, 'What is Scientism?'; Michael Shermer, 'The Shamans of Scientism'; Hammer, *Claiming Knowledge*, 206.

The utilitarianism of John Stuart Mill and his followers should in fact be seen as a central example (although Berman would likely see Mill's approach as amounting to an *instrumentalization* of human values), as should Auguste Comte's positivist "religion of humanity", the various forms of secular humanism, and programmes based on ethical extrapolations from Darwinism, to name but the most influential and well-known examples.<sup>25</sup> Whether one agrees with the prospect of such attempts or not is another matter; either way, the claim that "scientific" ideologies relied on the fact/value distinction is factually incorrect.

While seriously flawed as a scholarly analysis, Berman's work has been successful as a rallying cry for other academic activists sharing his central persuasions. The book has been quoted in works concerned with developing radical non-anthropocentric views of ecology,<sup>26</sup> by feminist theorists of science,<sup>27</sup> and has been used to support the attempt to merge ecology and feminism in a unified "ecofeminism".<sup>28</sup> Unsurprisingly, Berman's work has also made a sizeable impact on the New Age science discourse, quoted in such books as Larry Dossey's *Recovering the Soul* (1989), Rupert Sheldrake's *The Rebirth of Nature* (1991), and Amit Goswami's *The Self-Aware Universe* (1993). In fact, when Berman projects the disenchantment/enchantment dichotomy onto historical material he creates a typical "fall and redemption" narrative amounting to an "emic historiography of science". It homogenises and demonises "modernity" and "modern science", romanticises the premodern, and builds a utopian historical eschatology around the dream of a re-enchanted, holistic society of the future.<sup>29</sup>

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<sup>25</sup> For overviews of these and other irreligious worldview movements, see e.g. Jennifer Michael Hecht, *The End of the Soul*; Bernard Lightman, *The Origins of Agnosticism*; Colin Campbell, *Toward a Sociology of Irreligion*; Richard Olson, *Science and Scientism in Nineteenth-Century Europe*.

<sup>26</sup> E.g. Warwick Fox, *Toward a Transpersonal Ecology*. It was also discussed widely in journals connected with "deep ecology" and related environmental discourse, such as *Environmental Ethics*, and *The Trumpeter: Journal of Ecosophy*. For deep ecology's interaction with esoteric discourses more generally, see J. Christian Greer, 'Deep Ecology and the Study of Western Esotericism'.

<sup>27</sup> E.g. Sandra G. Harding, *Whose Science? Whose Knowledge?*

<sup>28</sup> E.g. Irene Diamond & Gloria Feman Orenstein (eds.), *Reweaving the World*.

<sup>29</sup> The notion of an emic historiography of science, and its relation to the *etic* historiography of science, will be developed further throughout part two of this work. I am proposing this distinction as a special case of the emic vs. etic historiography that Olav Hammer has operationalised as a critical tool in the study of self-fashioning and mythmaking among modern esoteric and religious spokespersons. See Hammer, *Claiming Knowledge*, 85-89, 155-181; cf. Aspren & Granholm, 'Constructing Esotericisms'.

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I will now turn to another academic contributor to the re-enchantment paradigm, namely the philosopher of religion David Ray Griffin.<sup>30</sup> In 1988, Griffin introduced a book series at State University of New York Press, concerned with what he called 'Constructive Postmodern Thought'.<sup>31</sup> This series, which by now includes thirty-two books, was launched with an edited volume entitled *The Reenchantment of Science* (1988). The volume continued the main trend from Berman's book, mixing history and philosophy of science with explicit connections to the religious discourse of the contemporaneous New Age movement. It stands as another primary example of the re-enchantment paradigm, highlighting crucial aspects of the uses of disenchantment within this brand of "postmodern" academic activism.

In the introduction to the book series on 'Constructive Postmodern Thought', Griffin was clear to distance his own brand of postmodernism from the philosophical stances arising from 'pragmatism, physicalism, Ludwig Wittgenstein, Martin Heidegger, and Jacques Derrida and other recent French thinkers'.<sup>32</sup> Griffin considered these other positions to be part of a '*deconstructive or eliminative postmodernism*', which only amounted to relativism and nihilism. He even proposed that such eliminative postmodernism did not deserve to be called postmodern at all, but rather '*ultramodernism*, in that its eliminations result from carrying modern premises to their logical conclusions'.<sup>33</sup> Griffin's own postmodernism was, by contrast, explicitly aimed at *overcoming* modernity. Since he also identified the project of modernity with *disenchantment*, true postmodernism had to embrace a re-enchantment of nature,

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<sup>30</sup> More recently, Griffin has become notorious for his deep involvement with the 9/11 "truth movement", having written no less than eleven books of rampant conspiracy theory. For a recent review and criticism of the "truth movement", see Jonathan Kay, *Among the Truthers*.

<sup>31</sup> The series has published 32 books since its inception in 1988 until 2004, when the last publication appeared. Themes include quantum physics and Whiteheadian process philosophy, criticisms of modern medicine, religion and naturalism, politics and the ecological crisis, and various approaches to "postmodern theology". For a full list, see SUNY Press' catalogue of the series: <http://www.sunypress.edu/Searchadv.aspx?IsSubmit=true&CategoryID=6899&pagenum=1&groupnow=1> (accessed May 19, 2011).

<sup>32</sup> Griffin, 'Introduction to SUNY Series in Constructive Postmodern Thought', x.

<sup>33</sup> *Ibid.*

society, and science. Griffin's position was thus to be called a '*constructive or revisionary*' postmodernism:

It seeks to overcome the modern worldview not by eliminating the possibility of worldviews as such, but by constructing a postmodern worldview through revision of modern premises and traditional concepts. This constructive or revisionary postmodernism involves a new unity of scientific, ethical, aesthetic, and religious intuitions. It rejects not science as such but only that scientism in which the data of the modern natural sciences are alone allowed to contribute to the construction of our worldview.<sup>34</sup>

The essays collected by Griffin for the start of the new series discuss '*a reversal of the modern disenchantment of science and nature* and how this reversal fits within the larger contemporary reassessment of natural science'.<sup>35</sup> In doing this, Griffin's main point is however to separate "modern science" from the general taxon of "science" as such, and to claim that it is only science in its "modern" branch that has been a disenchanting and hence destructive force. In other words, Griffin claims there is no *necessary* link between scientific activity and the disenchantment of the world, which means that a re-enchanted science remains a distinct possibility.<sup>36</sup> Following this train of thought, Griffin listed four contemporary trends that he felt were about to break the spell of disenchantment: '*a new view of the nature of science, a new view of the origin of modern science, new developments within science itself, and reflections on the mind-body problem*'.<sup>37</sup>

By '*a new view of the nature of science*' Griffin refers to the "postmodern" developments in social and historical studies of science that were becoming fashionable at the time. In Griffin's opinion, this development was of unprecedented epistemological relevance because it undermined science's claim to objectivity:

The recognition of the way our interpretations and even perceptions are conditioned by language, by culture in general, by the dominant worldview of the time, by personal (including unconscious) interests, and by interests based on race, gender, and social class –

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<sup>34</sup> Ibid.

<sup>35</sup> Griffin, 'Introduction: The Reenchantment of Science', 1. Italics added.

<sup>36</sup> Ibid., 7-8.

<sup>37</sup> Ibid., 8. Italics added.

this recognition has led many to the conclusion that a worldview is wholly a construction or a projection, not at all a reflection of discovery or the way things “really” are.<sup>38</sup>

Despite seeing hope in this development, Griffin writes about the constructivist interpretation of science with noticeable reservation. In fact, he goes on to acknowledge that this ‘extreme view’ is unsatisfying and self-refuting, opting for a more nuanced position instead. Griffin argues that the constructionist and relativist attack strikes primarily at the *worldviews* sometimes supposed by science, rather than at the actual practice of science as such. The scientific enterprise does still have a privileged position with regards to creating “objective knowledge” about the natural world, even despite the obstacles of all too human interests interfering with the process, but this authority does not extend to the interpretations of facts and the construction of worldviews. Griffin’s perspective thus comes curiously close to Weber’s original thesis, in which worldviews cannot strictly speaking be extrapolated from natural facts.<sup>39</sup> Griffin’s constructive postmodernism appears much less radical than it claims on the surface.

As to the ‘new view of the origin of modern science’, Griffin broke the news that historians of early modern science were now suggesting that the heroes of the scientific revolution had not all promoted disenchanted worldviews. Even the mechanistic philosophy was originally tied to theological programs in natural philosophy.<sup>40</sup> Surprisingly, perhaps, Griffin only makes a passing reference to the influential work of Frances Yates in this context, and her notion of a “Hermetic phase” of the scientific revolution.<sup>41</sup> At any rate, the ability to see the complexities of early modern natural philosophy, including the complexity of the mechanical philosophy itself, makes Griffin’s use of the history of science much more nuanced than the monolithic and demonised view of “Cartesianism” presented by Berman.

Both of the above two points were intended to show that science does not *necessitate* disenchantment, suggesting to the contrary that enchanted perspectives

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<sup>38</sup> Ibid., 9.

<sup>39</sup> Ibid., 9-10.

<sup>40</sup> Ibid., 10-13.

<sup>41</sup> Ibid., 37 n43. The Yates thesis did have a significant reception in countercultural discourses of the period, as it could easily be co-opted to portray a historical struggle between an underground of enchantment and an establishment of disenchantment and/or dogmatic Christianity. See Hanegraaff, ‘Beyond the Yates Paradigm’, 18-21.



have been at the origin of modern science itself. Griffin's last two points move on to suggest that an impulse towards re-enchantment is currently underway in scientific and philosophical discourse.<sup>42</sup> Quantum mechanics is a usual suspect, although Griffin voices reservations about the all too common jump from its scientific interpretations to "mysticism" or "Eastern spirituality". He cites David Bohm, whose theory of the "implicate order" received much attention in New Age circles in the 1980s, as a more promising spokesperson. Suitably, Bohm contributed a chapter to the book itself.<sup>43</sup> Moving from physics to biology, Griffin discusses the organicist notion of "downward causation" (i.e. that organisms as wholes may in some sense determine the development of their constituent parts, rather than the other way around) as another trend pointing towards re-enchantment. The "Gaia hypothesis" of James Lovelock is brought in as a radical example of organicist and holistic thinking on a grand scale,<sup>44</sup> while Rupert Sheldrake's neovitalistic "morphic resonance" theory is mentioned as another development in biology that seemed to challenge mechanistic and reductionist modes of explanation.<sup>45</sup> As we shall see in chapter five, all of these biological questions concerning vitalism and organicism were in fact prefigured during the 1920s and 1930s. Indeed, as a re-enchantment theorist Griffin draws on a particular organicist school of thought that we shall discuss at length in later chapters.<sup>46</sup>

The search for signs of enchantment in science continues with Griffin's last point: 'reflections on the relation between mind and matter'.<sup>47</sup> Referring to the traditional mind-body problem, Griffin questions the validity of the "disenchanted scientific worldview" as it is apparently incapable of accounting for minds:

both dualism and materialism are unintelligible. But if the modern premise that the elementary units of nature are insentient is accepted, dualism and materialism are the only

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<sup>42</sup> Griffin, 'Introduction', 13.

<sup>43</sup> Ibid., 14. Cf. Bohm, 'Postmodern Science and a Postmodern World'.

<sup>44</sup> Griffin, 'Introduction: The Reenchantment of Science', 15.

<sup>45</sup> Ibid., 16-17.

<sup>46</sup> I am thinking in particular of the more theologically oriented segment of so-called emergence theory. Griffin is particularly preoccupied with Alfred North Whitehead's "process philosophy", a school of thought that will be discussed in the context of new natural theologies in chapter six below.

<sup>47</sup> Griffin, 'Introduction: The Reenchantment of Science', 17-21.

options. This fact suggests that the premise that lies behind the modern disenchantment of the world is false.<sup>48</sup>

Griffin considers this to be ‘a strong philosophical argument’, suggesting that a new scientific worldview is needed.

‘Whereas modern science has led to the disenchantment of the world and itself, a number of factors today are converging towards a postmodern organicism in which science and the world are reenchanted’, Griffin concludes.<sup>49</sup> Organicism is not only taken as a theoretical framework for understanding nature, however: it is also clear that organicist thinking is to inform the ordering of society, including the academy. Referring to the philosopher of science Stephen Toulmin’s book, *The Return to Cosmology* (1982), re-enchantment is aligned with the quest for unification of the “special sciences”, which is to be brought about through a dialogue between scientists, philosophers, and theologians.<sup>50</sup> Following the reasoning that we saw in Berman’s work, then, the promise of an organic unification of knowledge and the return of a “holistic” conception of the world assume messianic proportions. Somehow, changes in the structure of human knowledge are supposed to have a salvific effect on humanity and the world itself, leading to freedom, fulfilment, and ecological harmony.

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In closing this discussion of the re-enchantment paradigm we should pay attention to some particularly striking features. Advocates of re-enchantment appear to be struggling not only with “disenchantment” as such, but with problems associated with *specialisation* and *fragmentation*. Knowledge is specialised, society fragmented, and people are not “at home in the world”. From a sociological perspective, the subjective experience and moral condemnation of “fragmentation” may be described as responses to the societal processes of functional differentiation that have characterised Western modernity: societies have become more complex, and different spheres have been differentiated from each other to fulfil different functions. However, while a sociologist finds the *reasons* for differentiation in social processes driven by the choices and actions

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<sup>48</sup> Ibid., 21.

<sup>49</sup> Ibid., 30.

<sup>50</sup> Ibid., 30-31.

of individual social actors, both Berman and Griffin reveal curious idealistic biases, attributing formidable agency to ideas and worldviews. According to these authors the fragmentation of knowledge and the fragmentation of society are two sides of the same coin. The twin fragmentation of knowledge/society is furthermore presented as the active cause of ecological crises, psychological “dismemberment”, and moral degeneration. A call for re-enchantment, unification, and holism is the answer to these ailments. The diagnosis is philosophical, and the treatment proscribed is an infusion of the *idea* of wholeness. These idealistic presuppositions put the aspirations of re-enchantment theorists very close to some of the movements of the early 20<sup>th</sup> century that we shall consider at length in later chapters. Authors such as Berman and Griffin struggle with the very same problem of disenchantment as early 20<sup>th</sup> century authors did, finding solutions that are indebted to their often unnamed forbears.

The underlying assumptions of the re-enchantment paradigm also appear to have much in common with the melancholia so often characteristic of the esoteric visionary.<sup>51</sup> The aspiration is nothing less than absolute knowledge, the attainment of which will heal the individual, the society, and the whole wide world. Only when total knowledge is restored – and the whole of society recants its “reductionist” errors and converts to the Good and True philosophy of wholeness – can the world be healed. The re-enchantment paradigm is thus located in a highly problematic borderland between academic scholarship and politico-spiritual advocacy, with the attitudes of the latter typically triumphing over the needs of the former.

While Weber’s original disenchantment thesis may have harboured certain philosophical and theological biases, as I argued in chapter one, the re-enchantment paradigm makes such biases explicit in its eagerness to *counter* disenchantment. Here, specific philosophical and theological positions are elevated to criteria for interpreting and judging historical material. This renders the re-enchantment paradigm useless in view of our present concerns. It should be considered a cluster of specifically post-war *responses* to the problem of disenchantment: for the approach I seek to develop here, the re-enchantment paradigm must be considered an *explanandum* rather than an *explanans*.

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<sup>51</sup> For examples, see the chapters in part four of this book.

## 2 THE REACH OF SCIENCE: NATURALISM AND SCIENTIFIC WORLDVIEWS

Both the original disenchantment thesis and the more recent re-enchantment paradigm are built on evident philosophical and theological biases, and for this reason end up portraying the relationship between science and worldviews in ways that are either idealised or demonised. We still need a better assessment of the *actual*, as opposed to the ideal and the dystopian, relation between science and worldviews in historical reality. In the present section I will provide a constructive discussion by considering a term that is of great importance for understanding this relation in the period that concerns us here: scientific naturalism.

We may distinguish between two different meanings for the term scientific naturalism. One refers to a historical intellectual movement in the second half of the 19<sup>th</sup> century, developed by leading spokespersons of science during the height of its professionalisation process. For sake of clarity, and following convention, I refer to this type as “Victorian scientific naturalism”. The other meaning of naturalism is broader, and refers to a range of philosophical positions associated with certain epistemological and/or ontological commitments based above all on the idea of the *continuity* and *self-sufficiency* of nature. I will refer to this latter class as “philosophical naturalism”.

The historical movement of Victorian scientific naturalism is crucial to the “worldview of science” discussion, because it constitutes an explicit attempt by scientists and public spokespersons of the newly professionalised natural sciences to develop and promote worldviews for a modern, industrialised age. As such, Victorian naturalism is an important intellectual context of science at the beginning of the 20<sup>th</sup> century, and, I shall argue, a source of some of the stereotypes of science that we have seen reproduced both by Weber and by the later re-enchantment paradigm. The philosophical current is also important to our concerns, because it encompasses a cluster of positions in the philosophy of science that typically *diverge* from the assumptions about science and worldviews informing the original disenchantment thesis. By comparing and contrasting naturalism with the assumptions of disenchantment we are able to see more clearly what is really at stake in the “problem of disenchantment”, and to place it within a field of philosophical and scientific tension that arises between naturalisation and disenchantment.

## VICTORIAN SCIENTIFIC NATURALISM: A HISTORICAL PERSPECTIVE

Victorian scientific naturalism was an intellectual movement that developed through the 19<sup>th</sup> century in Britain. As Bernard Lightman writes, it should be considered ‘the English equivalent of the cult of science in vogue throughout Europe during the second half of the nineteenth century’.<sup>52</sup> Victorian naturalism is part of a broader family of ideas about science in this period, making it the sister of German scientific materialism and Comtean positivism in France.<sup>53</sup> The intellectual roots of the movement, however, go back to Enlightenment philosophy. The influence of the British empiricists, particularly Locke and Hume, together with (perhaps selective) readings of Kant, helped form the epistemological basis of the movement. But this epistemological background was crucially reinforced by developments internal to the sciences and by new emerging discourses on nature, above all evolutionary theory and new theories of matter and energy. From the middle of the century a fully-fledged and articulate movement emerged around the concept of a “New Nature”<sup>54</sup>, a movement that would significantly shape the intellectual climate of the Victorian period. Combining ‘research, polemic wit, and literary eloquence,’ the scientific naturalists ‘defended and propagated a scientific world view based on atomism, conservation of energy, and evolution’.<sup>55</sup> In doing so, the naturalists engaged in what Thomas Gieryn has called “boundary-work”, protecting and legitimising the concerns of the emerging social class of scientific professionals, while excluding and attacking opponents and threats to the profession’s status.<sup>56</sup>

As Roger Luckhurst has suggested, from around the year 1870 we can talk about scientific naturalism as an “ideological settlement”.<sup>57</sup> The concept of “settlement” is borrowed from Bruno Latour, and refers to the binding together of

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<sup>52</sup> Lightman, *The Origins of Agnosticism*, 28.

<sup>53</sup> For the developments on the Continent, see Jennifer Hecht, *The End of the Soul* for France, and Frederick Gregory, *Scientific Materialism in Nineteenth Century Germany* for the German context. For an international overview, see Richard G. Olson, *Science and Scientism in Nineteenth-Century Europe*.

<sup>54</sup> Turner, *Between Science and Religion*, 8-17.

<sup>55</sup> Frank Miller Turner, ‘Victorian Scientific Naturalism and Thomas Carlyle’, 131.

<sup>56</sup> Gieryn, ‘Boundary-Work and the Demarcation of Science from Non-Science’; idem, *Cultural Boundaries of Science*, 37-64.

<sup>57</sup> Luckhurst, *Invention of Telepathy*, 12.

the epistemological question of how we can know the outside world, the psychological question of how a mind can maintain a connection with the outside world, the political question of how we can keep order in society, and the moral question of how we can live a good life – to sum up, “out there”, “in there”, “down there”, and “up there”.<sup>58</sup>

These are essentially worldview questions, and the scientific naturalists ventured to answer them all with reference to their conception of science and their new knowledge of the natural world. They argued that the soul was nailed to the material brain, which was itself a product of evolution. Varieties of “social Darwinism” offered solutions to societal problems, and “agnosticism” was proposed as the only proper epistemological and religious attitude. Meanwhile, a whole programme for educational, industrial and governmental reform, on naturalistic principles, was presented as *via regia* to progress for the Empire and heightened standards of living for its people.

To understand how this happened, it is important to look at the actual individuals involved with the movement. The ascendancy of Victorian scientific naturalism is in fact connected with a rather small coterie of people, which had gathered in 1864 to form what became known as the “X-Club”.<sup>59</sup> While this may sound like the name of a sinister conspiracy, the club was really nothing more than a group of influential friends who threw regular dinner parties in which they made sure to discuss important issues of science policy. As one contemporary observer wrote, the group ‘plotted an aggressive campaign to reclaim nature from theology and to place scientists at the head of English culture’.<sup>60</sup> They largely succeeded in their agenda: this small coterie of intellectuals ended up playing a crucial role in the professionalisation of science, elevating the status of the vocation and liberate it from clerical authorities.<sup>61</sup>

As the X-Club was essentially a dinner club, no formal protocols were kept of their meetings. It remained an informal network, which met off record to discuss and plan ‘concerted action’ for the advancement of ‘science, pure and free, untrammelled by

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<sup>58</sup> Latour, *Pandora’s Hope*, 310. Note that Latour talked more specifically about what he called the “modernist settlement”.

<sup>59</sup> Ruth Barton, “‘Huxley, Lubbock, and Half a Dozen Others’: Professionals and Gentlemen in the Formation of the X Club’.

<sup>60</sup> James Moore, quoted in Luckhurst, *Invention of Telepathy*, 13.

<sup>61</sup> Turner, ‘The Victorian Conflict between Science and Religion’, 180-200.

religious dogma'.<sup>62</sup> The nine people who made up the group were a mix of scientific professionals and gentlemanly amateurs. The influential biologist Thomas Henry Huxley, the surgeons George Busk and Joseph Hooker, the physicists John Tyndall and Thomas Hirst, and the chemist Edward Frankland all shared the experience of having struggled to find jobs as scientific professionals in a society where such positions were largely given by patronage rather than merit – patronage that was, furthermore, largely under the influence of clergy.<sup>63</sup> Other members included Herbert Spencer, who went further than any other in attempting to subsume all knowledge to an evolutionary paradigm through his “synthetic philosophy”. Another group member, John Lubbock, was an amateur scientist and a polymath, but as a Baron, a banker, and a Member of Parliament he provided important links to the worlds of politics and finance.

The X-Club network attained remarkable success. Between themselves, members of the dinner club held the presidency of the Royal Society three times in a row (Joseph Hooker, 1873-1878; William Spottiswoode, 1878-1883; T. H. Huxley, 1883-1885), they maintained authorial dominance in the newly formed journal *Nature*, held key positions in institutions such as the Royal Society of Mines, the Royal Institution, and University College London; additionally X-Club members were used as consultants for the government on issues of scientific research, industry, and education.<sup>64</sup> Through such concerted efforts the X-Club successfully raised the prestige of the naturalistic programme by linking it to the economy, the military, and the alleviation of social injustice.<sup>65</sup> Naturalism became, as Lightman suggests, ‘the apologetic tool of the Victorian middle class in its attempts to generate a new Weltanschauung, one appropriate in a competitive, urban, and industrial world, as a replacement for old philosophies and theologies suitable to a pastoral, agrarian, and aristocratic world’.<sup>66</sup> Again, this was a directed effort to produce a complete worldview for the modern, industrial age, replacing outmoded religious worldviews that had been shaped to fit life in the Bronze Age.

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<sup>62</sup> Thomas Hirst, quoted in Barton, “Huxley, Lubbock, and Half a Dozen Others”, 411.

<sup>63</sup> Luckhurst, *Invention of Telepathy*, 13; Turner, ‘The Victorian Conflict between Science and Religion’, 181. Cf. Barton, “Huxley, Lubbock, and Half a Dozen Others”.

<sup>64</sup> Turner, ‘The Victorian Conflict between Science and Religion’, 180-181.

<sup>65</sup> *Ibid.*

<sup>66</sup> Lightman, *The Origins of Agnosticism*, 29.

What, then, were the basic tenets of this scientific *Welanschauung*? What did the “New Nature” of the naturalists look like? In the words of Bernard Lightman, scientific naturalism was

naturalistic in the sense it would permit no recourse to causes not present in empirically observed nature, and it was scientific because nature was interpreted according to three major mid-century scientific theories, the atomic theory of matter, the conservation of energy, and evolution.<sup>67</sup>

Out of these theories were extracted, perhaps by allegory and metaphor rather than by derivation, certain tenets that were thought relevant to all fields of society. The most basic principles of the New Nature were those of the continuity of nature and the uniformity of life. All life was assumed to have evolved from the same primordial “protoplasm”, which was itself the product of a uniform and autonomous material world. The evolutionary paradigms of Darwin, Huxley, and Spencer all proposed solutions developed from this general idea. The human species was not metaphysically privileged among the animals; our mental and “spiritual” life did not imply any “higher worlds”. Naturalism was ontologically *monistic*; the world consists of only one kind of stuff – matter – meaning that concepts of “soul” and “consciousness” must either be reduced to and explained in terms of this stuff, or be eradicated from our ontological vocabulary altogether.<sup>68</sup> The same would, of course, hold for postulations of spirits or ghosts, while a god could at best be allowed in the form of a causally inconsequential deism: an absentee god that does not care and does not interfere with the course of life in the universe. This would be a god that, in terms of Huxley’s agnosticism, would remain forever unknown and unknowable. To claim anything specific about this god would remain absurd, as would the attempt to infer anything concerning ethics or values from its mere hypothetical existence.<sup>69</sup>

The unified, material world postulated by scientific naturalism was governed by invariable natural law, rejecting the possibility of any miraculous incursions or interventions. The impossibility of miracles would typically be argued with reference to

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<sup>67</sup> Lightman, *The Origins of Agnosticism*, 28; cf. Turner, *Between Science and Religion*, 8-37.

<sup>68</sup> See e.g. Maudsley, *The Physiology and Pathology of Mind*; cf. Olson, *Science and Scientism*, 240-243.

<sup>69</sup> For Huxley’s agnosticism, and the debate it sparked in the late 19<sup>th</sup> century, see chapter seven.



the principles of *thermodynamics*, formulated at the middle of the century by the Scottish engineer William Rankine, the German physicist Rudolf Clausius, and William Thomson (Lord Kelvin).<sup>70</sup> By postulating that the universe as a whole was a thermodynamically *closed* system, the conservation of energy meant that miracles were impossible because there could be no mysterious input of energy into a system. Miracles could thus be re-defined as breaking the first law of thermodynamics.

Extending from the ideas of invariable law, ontological monism, and the uniformity of nature, is the idea of the *universality* of science. The scientific method is universal, it is the only secure way to knowledge, and it ought to be applied to all fields of inquiry in which truth or certainty is desired. This notion, a strong form of epistemic optimism in the same sense as we saw it in the disenchantment thesis, was used by the Victorian naturalists to warrant a scientific *expansionism*, extending science's influence to new areas of society, from industrial production and agriculture, to social planning, ethics, and governance.<sup>71</sup> In later chapters we will see that religion, too, became subjected to this expansionist programme, giving rise to the prospective disciplines of psychical research and parapsychology, as well as to a scientific reconsideration of religion in the form of new natural theologies.<sup>72</sup> The epistemic optimism of the naturalists in this sense extended further than the disenchantment of the world would have allowed.

The idea of progress was central to the naturalistic programme. The Victorian naturalists generally shared Auguste Comte's notion of the progression of human thought through developmental stages, rising from a theological and religious-metaphysical stage to a gradually more scientific state of "positive knowledge". The anthropologist James George Frazer's *Golden Bough* is a *locus classicus* for the Victorian variety of this idea. Sometimes it would also be allied with developmental hypotheses borrowed from evolutionary theory. For example, the naturalists' embrace of a social policy of "functional liberal elitism" prompted speculations on the inheritance of genius and talent, which would warrant policies of selective breeding of human beings in order

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<sup>70</sup> See e.g. Crosbie Smith and M. Norton Wise, *Energy and Empire*.

<sup>71</sup> Cf. Luckhurst, *Invention of Telepathy*, 22.

<sup>72</sup> For psychical research and parapsychology, see the chapters in part three. For new natural theologies, see chapter six.

to secure the survival of a superior class of people that could, in turn, be the guardians of future progress.<sup>73</sup>

All of these diverse ideas were brought together in the attempt to erect a consistent worldview based on the most recent science. Since scientific knowledge was thought to bring an exact and objective understanding of reality, it was also ultimately more *useful* than other types of knowledge, which was why expansion of the scientific enterprise could be linked with progress on all levels of society. In short, a powerful image of science was created, replete with implications for worldviews, politics, industry, and society. The view of the Victorian naturalists, I shall argue, has had a considerable influence on later generations, including among those critical of the scientific enterprise.

#### NATURALISM AS A PHILOSOPHICAL CURRENT

The philosophical current of naturalism springs, in some sense, from the historical movement just described. In the 20<sup>th</sup> century it has taken other directions, giving rise to a number of different contributions to specific fields of academic philosophy, including philosophy of mind, philosophy of science, philosophy of language, logic, ethics, and metaphysics. The sheer diversity of the philosophical current of naturalism means that it is close to impossible to find one, single unifying point that all the systems of thought that have been espoused as “naturalistic” have in common.<sup>74</sup> The philosopher Owen Flanagan has, for example, identified fifteen different definitions of naturalism in the philosophical literature.<sup>75</sup> While some of them are mutually contradictory, many share obvious commonalities with the 19<sup>th</sup> century variety described above. Naturalism has, for example, been taken to imply that ‘[t]here is no room, or no need, for the invocation of immaterial agents or forces or causes in describing or accounting for things’; or that ‘[e]thics can be done without invoking theological or Platonic foundations’, claiming that

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<sup>73</sup> Turner, ‘Victorian Scientific Naturalism and Thomas Carlyle’, 137-138. For a clearer overview of the many different models of evolutionary change in this period, and still in the early decades of the 20<sup>th</sup> century, see chapter five below.

<sup>74</sup> Some state-of-the-art discussions include Hilary Kornblith, ‘Naturalism’; Phillip Kitcher, ‘The Naturalists Return’; Mario De Caro & David Macarthur (eds.), *Naturalism in Question*; Flanagan, ‘Varieties of Naturalism’.

<sup>75</sup> Flanagan, ‘Varieties of Naturalism’, 430-431.

a basis for proper conduct can 'be defended naturalistically'.<sup>76</sup> This position would amount to a naturalised ethics, which directly opposes the axiological scepticism of disenchantment. Additionally, naturalism may claim 'that most knowledge is a posteriori'.<sup>77</sup> In that case, a radical form of empiricism is involved, holding that so-called *a priori* and analytical truth (in the tradition stemming from Kant) is in reality masked *a posteriori* knowledge, a controversial implication being that even rules of logic or mathematics are in principle open for revision in light of new evidence.<sup>78</sup> Through a brief sketch of philosophical naturalism, it will be seen that it stands in conflict with the view of natural science that we have encountered in Weber as well as in the re-enchantment paradigm.

Philosophical naturalism took a distinct turn with William Van Orman Quine's writings on epistemology and science from the 1950s onwards.<sup>79</sup> The most basic position of Quinean naturalism is that philosophy is continuous with science, and cannot meaningfully or responsibly be practiced in separation from it: it gives primacy to the empirical sciences over and above philosophical considerations. The philosophical naturalist is suspicious about claims to *a priori* knowledge, which had been the domain of the "pure" philosopher since Kant. The naturalist, furthermore, insists that "foundationalism" about epistemology is not a viable option: the question of how we gain knowledge cannot be grounded on "necessary truths" that are grasped by *a priori* reasoning.<sup>80</sup> Instead, epistemology ought to be informed by the empirical or scientific study of how knowledge is *actually* attained in the natural world in which the quest for knowledge takes place: how our senses work, what happens in perception, how human minds function, how we reason, and how we delude ourselves are all scientific questions that must be at the basis of any sound epistemology.<sup>81</sup> In the

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<sup>76</sup> Ibid., 431.

<sup>77</sup> Ibid.

<sup>78</sup> This was one of the controversial but influential arguments of Willard Van Orman Quine's 1951 article, 'Two Dogmas of Empiricism'.

<sup>79</sup> Quine, 'Two Dogmas of Empiricism'; idem, 'Epistemology Naturalized'; cf. Kitcher, 'The Naturalists Return'.

<sup>80</sup> For a more recent extrapolation on this view, see Penelope Maddy, *Second Philosophy*.

<sup>81</sup> Kornblith (ed.), *Naturalizing Epistemology*; idem, 'Naturalism', 46; Kitcher, 'The Naturalists Return', 75-76.

naturalistic project, every single claim, doctrine or heuristic is revisable in principle in view of new experience.<sup>82</sup>

At this point we might add that there has been a tendency to distinguish between *ontological* naturalism on the one hand, and *epistemological* (or *methodological*) naturalism on the other.<sup>83</sup> One concerns what really exists in the world, while the other concerns how we can gain knowledge about whatever there is in the world. Epistemological naturalism, in its most simple definition, simply means adhering to the scientific method(s) – and, crucially, engaging in rational conversation with scientific experts in any field in which one seeks knowledge. Ontological naturalism, on an equally simple definition, means to assume the world to be composed of the actual entities that the best available science at any given point says that it is composed of.<sup>84</sup> Naturalistic ontology implies, in other words, a stance of scientific realism that may or may not be shared by the naturalistic epistemologist.

It should, however, be noted that philosophical naturalism is about more than epistemology and metaphysics. It has also been a considerable impulse in meta-ethics. In view of the axiological scepticism of disenchantment this is a particularly relevant branch to mention. Although varieties are many, naturalised ethics is fundamentally in opposition to roughly Platonic views, in the sense that it does not seek the source of ethical judgement in transcendent, *a priori*, or any other non- or supernatural sources.<sup>85</sup> There are no immaterial ideas of the good, and no universal golden rules (whether proclaimed in sermons or dictated by a categorical imperative). Instead, the naturalist claims, ethics must be grounded in a strictly *empirical* dimension; ethical judgement of characters and actions spring from the natural, empirical world of the senses.<sup>86</sup>

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<sup>82</sup> This was one of the most radical arguments of Quine's extremely influential 1951 article, 'Two Dogmas of Empiricism'.

<sup>83</sup> Cf. De Caro & Macarthur, 'Introduction: The Nature of Naturalism', 3-6.

<sup>84</sup> For this formulation, see especially Kornblith, 'Naturalism'.

<sup>85</sup> For overviews, see James Lenmann, 'Moral Naturalism'; Nicholas Sturgeon, 'Ethical Naturalism'.

<sup>86</sup> Without going into further detail, it will suffice to mention that this type of meta-ethical position is found with contemporary neo-Aristotelian duty ethics (central contemporary exponents include Martha Nussbaum and Judith Jarvis Thomson), and in the school known as "Cornell realism", revolving around the works of Richard Boyd, David Brink, and Nicholas Sturgeon in particular. For examples, see Nussbaum, 'Aristotle on Human Nature and the Foundations of Ethics'; Thomson, *Goodness and Advice*; Boyd, 'Finite Beings, Finite Goods' (two parts); Brink, *Moral Realism and the Foundations of Ethics*;

The criticism has lingered that naturalism, considered as a whole, is a rather vague cluster of positions.<sup>87</sup> Despite the tendencies mentioned here, there is no single definition of naturalism in current use. Nevertheless, there have been some illustrative attempts to uncover the “common core” of naturalism in the form of a minimum requirement that all naturalisms must satisfy. For our present purposes, it is quite suggestive that the only agreement seems to be a rejection of *supernaturalism*.<sup>88</sup> Simple though it may seem, this is a point that merits further attention. It is a point that connects the historical current of Victorian naturalism with the later philosophical currents, and provides us with an important framework for mapping the problem of disenchantment in the context of complex intellectual debates concerning the reach and limitations of natural knowledge.

#### NATURALISM VERSUS SUPERNATURALISM

It has been argued that, as far as debates about naturalism are concerned, ‘[w]hat is usually at issue is not whether to be “naturalistic” or not, but rather what is and what is not to be included in one’s conception of “nature”’.<sup>89</sup> This is an important point, because even when it comes to the opposition to super-naturalism, it signals that a variety of stronger and weaker naturalistic approaches are possible. One man’s supernatural may be another’s nature. In fact, the central naturalistic thesis when opposed to supernaturalism seems to be that there can be no room for “divine” or “spiritual” *agency*, particularly in *explaining* and *accounting for things* in the world. The focus is on the presumed *causal* activity of “spiritual beings” rather than their mere existence. Spiritual beings outside of this world may or may not exist – even a naturalistic agnostic of Huxley’s stature might admit that much. The problems only begin when one invokes the *activity* of spiritual entities and assign explanatory power to them.

Owen Flanagan has taken this line of definition a step further, and suggested that for supernaturalism to be really “objectionable” it has to adhere to all of the following three statements:

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<sup>87</sup> E.g. Barry Stroud, ‘The Charm of Naturalism’; Lawrence Sklar, ‘Naturalism and the Interpretation of Theories’; Hilary Putnam, ‘The Content and Appeal of “Naturalism”’; Owen Flanagan, ‘Varieties of Naturalism’.

<sup>88</sup> E.g. Stroud, ‘The Charm of Naturalism’, 44; Flanagan, ‘Varieties of Naturalism’, 432-433.

<sup>89</sup> Stroud, ‘The Charm of Naturalism’, 43.

- (i) There exists a supernatural being or beings, or power(s) *outside* of the natural world;
- (ii) These “beings” or “powers” have *causal commerce* with this world;
- (iii) the grounds for belief in both the “supernatural being” and its causal activity cannot be seen, discovered, or inferred by way of any known and reliable epistemic methods.<sup>90</sup>

Since “objectionable supernaturalism” is the kind that accepts all three propositions, there is room for a number of more modest positions.<sup>91</sup> On this basis we can model the relation between naturalism and supernaturalism as a continuum with two extremes and several middle positions, rather than as a strict dichotomy.

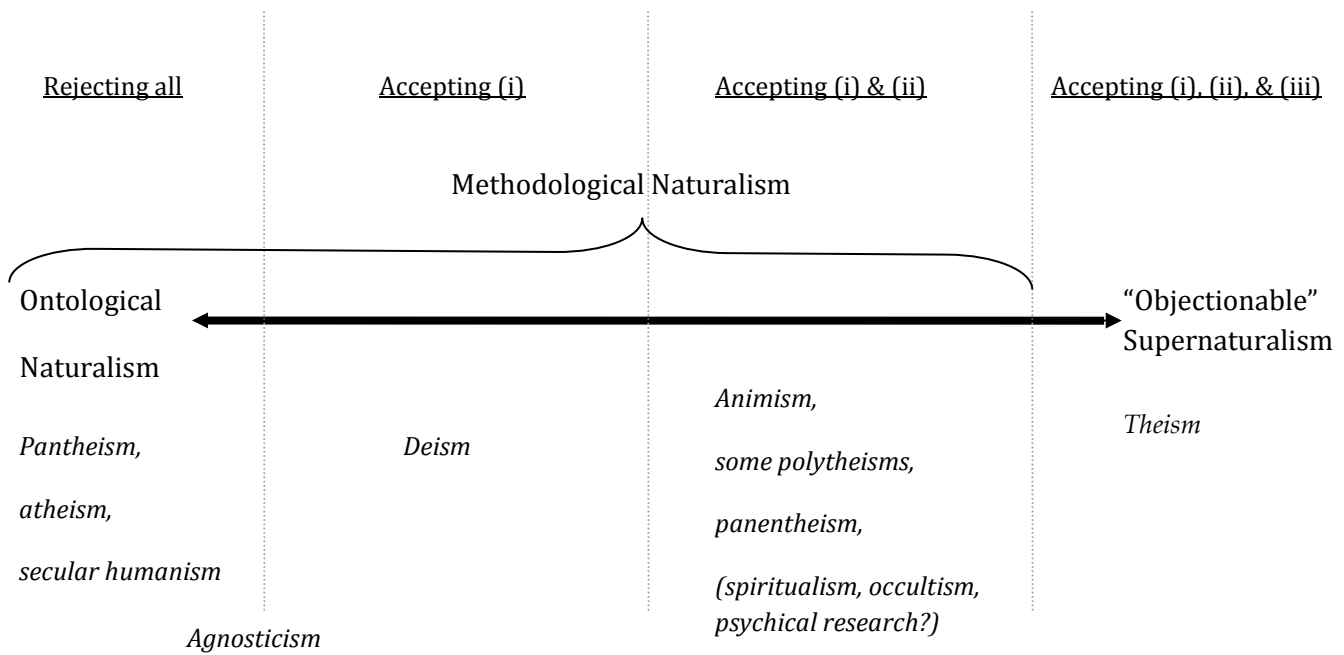
By constructing a model on these grounds, some interesting nuances come to light (figure 3). The most objectionable point for a naturalist is the epistemological resignation implied in the third premise above. What is truly unacceptable to a naturalist is to claim the existence of supernatural entities that have causal intercourse with the natural world, while urging that this activity must be taken on the basis of plain fideism, without recourse to intersubjectively available evidence or reasoning. In other words: non/super-natural entities *may* in fact be used to explain things if their activity is conceived in such a way that it can be discovered and tested empirically.

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<sup>90</sup> Extracted from Flanagan, ‘Varieties of Naturalism’, 433.

<sup>91</sup> Flanagan refers to such compromises as ‘religious naturalism’. Ibid.

### *Naturalism – supernaturalism continuum*



**Figure 3:** Some theological and religious positions on the naturalism-supernaturalism continuum. The model shows that whereas *ontological* naturalism requires the rejection of all the three criteria of supernaturalism, *methodological* naturalism allows points one and two in principle. It is possible to remain a deist, a panentheist, or even an animist, while remaining a methodological naturalist. The only thing excluded from the naturalistic spectrum altogether is the form of theism that requires faith alone.

Consider, for example, the efficacy of prayer: if a certain theological hypothesis allows for the measurement of effects of prayer, for example by running statistical studies on the influence of intercessory prayer on the healing process, the hypothesis is still within the naturalistic spectrum. The same would go for the testing of magical talismans for healing, or indeed any other ritual object, icon, or “fetish” assumed to have an actual effect on physical events. If it can be tested, it falls within the scope of *methodological* naturalism, and hence belongs to the naturalistic spectrum. If, however, the effect of prayer is claimed by theologians to be somehow *impossible* to test, for example because such tests are “blasphemous” or an impious exercise of putting ‘the Lord Your God to the test’ (Luke 4:12), then that hypothesis belongs to the supernaturalistic extreme of the spectrum, and is of the “objectionable” kind. Only then is it wholly incompatible with naturalism on any reading.

The above considerations mean that there is room for numerous forms of “religious naturalism” after objectionable supernaturalism has been eliminated. Pantheism in the tradition of Spinoza would, for example, be consistent with even the strongest naturalistic position, the rejection of (i), (ii), and (iii), and in this respect be ontologically indistinguishable from positions such as atheism and secular humanism. Furthermore, deists would be committed to the first proposition only, while rejecting the second (and thus automatically the third) with equal ferocity as any other naturalist. While deists take one step towards supernaturalism by claiming that there *is* a higher power outside of nature, they still have not reached the “objectionable form” since a non-interfering *deus absconditus* does not pose any problems for the autonomy of nature or the integrity of rational knowledge.

Moving further up the scale, it is possible to hold the second proposition, too, without abandoning the naturalistic project altogether. If one accepts (i) and (ii) and holds that the spiritual beings have causal commerce with this world, then the claim can be formulated as an empirical hypothesis that is still compatible with methodological naturalism. Linking the “supernatural” and the empirical world (or stressing the empirically available *qualities* or *consequences* of the supernatural), without the resignation of the human capacity for knowledge, opens up for theological positions where gods and spirits may be interacted with in this world. The appeal to empirical evidence could still legitimately be employed in defence of beliefs about such beings and their powers. The category would include theologies that emphasise divine immanence, such as varieties of polytheism, panentheism, and animism.<sup>92</sup>

I argue that this last category has historically been very attractive to certain men of science with religious cravings, especially from the late Victorian period onwards. It has given rise to what I propose to call an “open-ended naturalism”. As we shall see in later chapters, an open-ended naturalism has been the epistemological starting point

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<sup>92</sup> We should note that some possible semantic problems arise here if we take Flanagan’s definition literally. Animists or even polytheists are not strictly speaking committed to anything “supernatural” in the sense of entities being *outside of* nature. In fact, here we seem better off looking back to Weber: if we forget for a moment the association of “supernaturalism” with “transcendence”, what is at stake is rather the presence or non-presence of “mysterious incalculable forces” *within* nature. In other words, this category should include immanence. Harking back to Barry Stroud (*op. cit.*), the question is what to include in one’s conception of “nature”.



for psychical researchers, proponents of new natural theologies, and for many spiritualists and occultists as well.<sup>93</sup> However, the promise of “positive religion” has also left a flank wide open for scepticism. Holding that the healing power of spirits is in principle a rational and empirical matter is well and good, but what if, after repeated tests, the evidence simply fails to show? If the naturalistic game is played seriously, one has also committed oneself to accept verdicts of falsification. The interesting dilemmas created by this fact will occupy us at length in later chapters, and particularly in the context of psychical research and parapsychology.

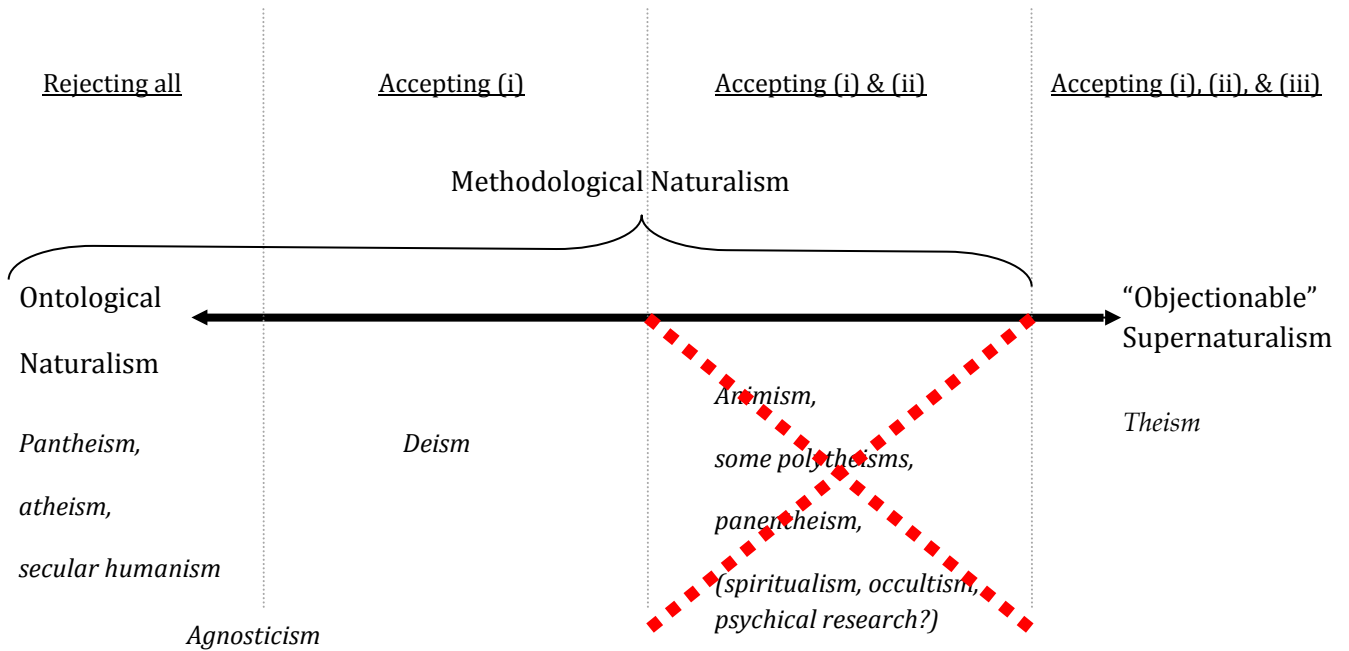
#### BETWEEN NATURALISATION AND DISENCHANTMENT: MAPPING THE BLIND SPOT

With reference to the naturalism-supernaturalism continuum that I have presented above we are able to identify with more precision the blind spot of Weberian disenchantment that occupied us in chapter one.

As seen in figure 4 below, the disenchantment of the world would imply the rejection of that cluster of positions and attitudes that accept Flanagan’s first and second proposition, while rejecting the third. These positions, which I have identified as being compatible with an “open-ended naturalism”, presume that divine, spiritual, or magical agents are still at work within nature, and that traces of spiritual activity in the world can be uncovered, understood, and even manipulated by human agents through rational and empirical means. Indeed, by approaching the ostensibly “supernatural” with a methodological naturalism, members of this category have already rejected the intellectual sacrifice. Instead, they steadfastly push the limits of reason and evidence into the sphere of the religious.

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<sup>93</sup> See especially chapters six to twelve.



**Figure 4:** The blind spot of disenchantment projected on the naturalism-supernaturalism continuum.

This mapping underscores some interesting differences between disenchantment and naturalisation as two different epistemological conceptualisations of the relation between science and religion. Weberian disenchantment and scientific naturalists reject and accept different things. A naturalist rejects any causal powers outside of this world, *if* these are supposed to have no ways of being traced or understood by scientific methods. Weberian disenchantment, to the contrary, rejects any “supernatural” entities or forces at play within the empirical, natural world, dismissing the attempt to back up claims about such entities with empirical support as being illegitimate and deluded. This means that there is a conflict between disenchantment and the very principles of naturalism. This conflict is fundamental, and it concerns the “intellectual sacrifice”. Forsaking reason and the pursuit of empirical support is the only way in which genuine religion can be achieved in the disenchanted view. Deism and theism are both viable, as long as they do not presume to meddle with scientific reasoning and argumentation. For the naturalist, everything hinges on respecting scientific principles. Undergoing the intellectual sacrifice means to disqualify oneself from the project altogether. Weberian disenchantment saves “pure religion” while disqualifying magic. Naturalism disqualifies “pure religion” as inconsequential at

best, and nonsensical at worst. It is in the middle of these tensions, I suggest, that the problem of disenchantment arises.

### 3 DISENCHANTMENT REVISITED

I have suggested that the complexity of epistemological, theological, and metaphysical discussions on the outer boundaries of science in the early 20<sup>th</sup> century can better be grasped by focusing on the “problem of disenchantment”. Before we can move on to actually apply this concept in analyses of historical material there is, however, one more question that must be dealt with seriously. When the Weberian disenchantment thesis and the re-enchantment paradigm have both been rejected as philosophically and theologically biased, it behoves us to reflect on the philosophical foundations of my own approach. This is necessary to avoid a self-defeating relativism, on the one hand, and the illusion of theory-independtness, on the other. Over the following few pages I shall make the case that a broadly naturalistic philosophy of science, wedded to a constructionist approach, is the best starting-point for the historian who wishes to understand the shifting relations between science and other discourses. The present section thus lays the final touches on my theoretical approach to the problem of disenchantment. In the conclusion, I will apply it in practice to answer the question that has been at the forefront throughout this chapter: how to interpret the relation between science and worldviews?

#### TOWARDS A CRITICAL NATURALISTIC CONSTRUCTIONISM

With the hype of “post-positivism” now having lost the novelty it enjoyed some forty years ago,<sup>94</sup> and the bitter “science wars” having come to a cease fire,<sup>95</sup> there has in recent years been a proliferation of philosophical works on science that go in

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<sup>94</sup> See especially Zammito, *A Nice Derangement of Epistemes* for a thorough historical and philosophical review of the many and consecutive revolts against logical-positivism, realism and the so-called “received view”, starting with Quine, through Kuhn, Feyerabend, Lakatos, Laudan, etc., and on to the sociological programmes of people like Bloor, Barnes, Shapin, Collins, Pinch, Latour, Woolgar, etc.

<sup>95</sup> For constructive overviews of these epistemic clashes of the 1990s, see e.g. Phillip Kitcher, ‘A Plea for Science Studies’. A retrospect was recently published by one of the main instigators and provocateurs of the “war” (on the side of the “realists”): Alan D. Sokal, *Beyond the Hoax*.

naturalistic and realist directions.<sup>96</sup> This means that dismissing the philosophical foundations of the original disenchantment thesis can easily be done without dismissing the possibility of building a robust philosophy of science, and without pressing a radical agenda of re-enchantment in the lines of Berman or Griffin. In fact, if one were to contest that the three dimensions of disenchantment – epistemic optimism, axiological scepticism, and metaphysical scepticism – provide a good picture of how modern science actually relates to the world and to other spheres of human interest, the call for “re-enchantment” appears meaningless in the first place. It emerges as a rushed response to a non-existing problem.

This said, it is not immediately clear that a philosophy of science would at all be needed by the kind of historical approach to questions about science and worldview that this book adopts. By comparison, historians of religions are not required to adopt a theology of their own in order to study the controversies between theologians – frankly, in the cases that they actually do adopt a theology, it would usually have been much better had they not. What is needed, however, is a theoretical foundation and a methodology capable of answering the types of questions which one’s research is dedicated to asking. This is easy enough for the historian of theology, since one’s theological position on god is unlikely to have any direct bearing on the historians’ own methodological practice. It is, however, precisely here that the matter becomes more complicated for the historian who takes some of the fundamental epistemological debates of the academy as his subject matter. The very act of writing scholarly and

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<sup>96</sup> In addition to the works cited in the naturalism chapter above, some recent major contributions to this rapidly growing literature include, e.g., Hilary Kornblith, *Knowledge and Its Place in Nature*; Penelope Maddy, *Second Philosophy*; Alexander Bird, *Nature’s Metaphysics*; James Ladyman & Don Ross, *Every Thing Must Go*. In addition, many similar projects exist in e.g. new defences of scientific realism (Stathis Psillos, *Scientific Realism*), or in the burgeoning field of “embodied cognition”, neurophenomenology, and similar body/brain/environment oriented approaches to mental functioning, perception, knowledge production, etc. See e.g. Shaun Gallagher, *How the Body Shapes the Mind*; Tyler Burge, *Origins of Objectivity*; Alva Noë, *Out of Our Heads*; Lawrence Shapiro, *Embodied Cognition*. In addition, one could cite earlier works by Francisco Varela, Evan Thomspon, Eleanor Rosch, and Antonio Damasio, as well as that of Paul and Patricia Churchland, exploring the relations between neurology, phenomenology, and the philosophy of mind, ultimately having implications for epistemology and the philosophy of science. For a serious attempt to introduce these approaches into research in the humanities, see Edward Slingerland, *What Science Offers the Humanities*.

methodically about the foundations of *other* academic practices implies taking a minimum stance on some of the discourses that are being discussed. A certain degree of recursivity is unavoidable. I seek to meet the challenges that this creates by developing a methodological stance that borrows significantly from naturalistic philosophy of science on the one hand, and constructionist methodologies in the social sciences on the other. These, I furthermore hold, are entirely compatible with some of the key elements of Weber's own methodology for social science, as mentioned in the previous chapter: namely the conceptualisation of history as *Problemgeschichte*, and a methodological individualism applied to questions of agency.<sup>97</sup>

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In wishing to embed humanities research more firmly in a solid naturalistic framework and to halt some of the excesses of postmodern theorising, this project is only following a trend that has been gaining momentum in recent years.<sup>98</sup> The specific approach I propose might best be described as a *qualified, critical constructionism on naturalistic grounds*. It borrows from social constructionism the assumption that articulated worldviews and value systems, as cultural phenomena, are human constructs arising from the interplay of individual social actors.<sup>99</sup> Such construction takes place in myriads of ways, through multiple channels and by different means and mechanisms, depending on the construct in question. Value systems may for example be constructed in the socialisation of children, from parenting to education, in relation to broader worldviews presented and propagated through social and cultural institutions, from churches to schools to popular culture, which, again, relate to those yet more subtle and hard-to-catch "plausibility structures"<sup>100</sup> of a particular time and place – the basic cognitive, linguistic, and discursive space within which ideas and concepts can emerge, take shape, and be evaluated by individual actors. The space of plausibility is historically contingent

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<sup>97</sup> Again, cf. Otto Gerhard Oexle (ed.), *Das Problem der Problemgeschichte*; Jon Elster, 'The Case for Methodological Individualism'.

<sup>98</sup> For a general work in this field, see e.g. Slingerland, *What Science Offers the Humanities*.

<sup>99</sup> E.g. Berger & Luckmann, *The Social Construction of Reality*; Berger, *The Sacred Canopy*.

<sup>100</sup> Cf. Berger, *The Sacred Canopy*, 45-51, 123-135.

and open to change over time; thus we should also recognise the relevance of Foucault's "historical *a priori*" and related concepts.<sup>101</sup>

This is, however, exactly the point where constructionism moves into philosophically problematic territory: if not only scientific concepts, but even such epistemic foundations as "rationality" and "objectivity" are historically contingent constructs, then what are we left with as a basis for knowing anything at all? The philosopher of science Ian Hacking provides good tools for meeting such challenges.<sup>102</sup> Historical "meta-epistemologists" do not *do* epistemology as such: they do not 'propose, advocate, or refute theories of knowledge'.<sup>103</sup> Instead, they 'study epistemological concepts as objects that evolve and mutate ... the historical meta-epistemologist examines the trajectories of the objects that play certain roles in thinking about knowledge and belief'.<sup>104</sup> This does not *exclude* the possibility of epistemology, it merely emphasises its grounding in history and society.<sup>105</sup> The historical tracking of how certain epistemic possibilities arise and fade away may however inform the way one does epistemology, and not least the way that one judges standpoints of the past. One will, for example, be better able to explain the fortunes and failures of a certain knowledge-practice without falling victim to an anachronistic and present-centred judgment of those practices. Borrowing a point from the philosopher Phillip Kitcher, it is

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<sup>101</sup> Such as "historical epistemology" and "meta-epistemology", the former of which has been developed over the last few decades at the Max Planck Institute for the History of Science in Berlin. The latter was proposed in a response by Ian Hacking. My own approach is indebted to these schools in the history and philosophy of science. For major contributions, see Lorraine Daston & Peter Galison, *Objectivity*; Daston (ed.), *Biographies of Scientific Objects*; Mary Poovey, *A History of the Modern Fact*; Arnold Davidson, *Historical Epistemology and the Formation of Concepts*. Cf. Hacking, 'Historical Ontology', 9-14.

<sup>102</sup> See especially the critical but constructive treatment in Hacking, *The Social Construction of What?*, 1-35.

<sup>103</sup> Hacking, 'Historical Ontology', 9.

<sup>104</sup> *Ibid.*

<sup>105</sup> *Ibid.*, 25. Hacking's own career clearly testifies to this point. Since the 1960s he has done fundamental work in the philosophy of statistics, probability theory, and statistical inference, and more recently he has involved himself in rethinking Aristotelian categories in light of contemporary cognitive science. For some of his major contributions to the history and philosophy of science, see Hacking, *The Logic of Statistical Inference*; *idem*, *The Emergence of Probability*; *idem*, *Representing and Intervening*; *idem*, *The Taming of Chance*; *idem*, *An Introduction to Probability and Inductive Logic*; cf. also his work on the history of psychology and psychiatry, e.g. Hacking, *Mad Travellers*; *idem*, *Rewriting the Soul*.

perfectly possible to honour the actors' categories even while making use of more recent categories when explaining them.<sup>106</sup>

The constructionism that informs my approach is, as mentioned, intended to be critical, qualified, and naturalistic. It is critical, because interested in analysing the strategies wielded by individual actors in the social construction of concepts, facts, theories, and worldviews. This involves a hermeneutic of suspicion, which probes beneath the surface of texts, narratives, and accounts of facts, to ask questions about interests, reasons, and social effects implied in specific speech-acts.<sup>107</sup> The approach I promote is, furthermore, *qualified* because it does not claim constructionism “all the way down”. That is, it does not assume that social constructionism stands in a necessary opposition to “realism”. As several commentators have pointed out during and after the “science wars”, the slippery-slope from constructionism to relativism (as far as studies of science go) seems to have been a consequence of taking its epistemology much too seriously.<sup>108</sup> In Kitcher’s words, an excessive emphasis on the epistemological consequences of constructionism has given rise to a ‘dogmatic relativism’, with key dogmas being that there is no truth save by social acceptance, that no system of belief is constrained by reason or reality, and that no system is epistemologically privileged.<sup>109</sup> By contrast to these dogmas, the constructionism informing my own argument does *not* deny nature and reason as “pre-discursive” elements constraining the production of knowledge and culture. It is in this sense that my position is *naturalistically grounded*. The radical constructionist appears to be committed to a *tabula rasa* view of human

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<sup>106</sup> Kitcher, ‘A Plea for Science Studies’, 38.

<sup>107</sup> Here I generally follow the prescriptions of Bruce Lincoln, ‘Theses on Method’. However, my scope of analysis is not restricted to “religion”, as was his, but also to certain discourses of science and philosophy. This does make the matter more complicated than it was in Lincoln’s case, which is the reason for writing this section in the first place. The reference to “speech-acts” should be viewed in light of Quentin Skinner’s methodological focus on the illocutionary and perlocutionary effects of historical texts, rather than the strict language philosophy of Austin (and Searle). For a discussion, see the essays in James Tully (ed.), *Meaning and Context*.

<sup>108</sup> For analyses along these lines, see especially John Zammito, *A Nice Derangement of Epistemes*, esp. 123-182; cf. Kitcher, ‘A Plea for Science Studies’, 38-44.

<sup>109</sup> Kitcher, ‘A Plea for Science Studies’, 38. These are the two out of “four dogmas” Kitcher identifies. The two others imply that there shall be no asymmetries in explanation of truth or falsehood, society or nature; and that honour must always be given to the “actor’s categories”.

cognition that it simply contradicted by the knowledge produced in fields such as cognitive science, psychology, linguistics, and neurology.<sup>110</sup> A more robust constructionism must be built on a naturalistic foundation in which biological and psychological constraints on human experience, cognition, communication, and representational practices are taken for granted.<sup>111</sup>

Furthermore, robust, naturalistic constructionists must make a serious effort to stay up to date on the systems of knowledge that are being constructed by their colleagues in other disciplines. An interdisciplinary imperative forces the scholar to seek out, to his or her best ability, the current state of knowledge in any other field or discipline that he or she overlaps with. This is a requirement of methodological naturalism that I propose to call the “endoxic principle”.<sup>112</sup> While postmodern theorists of science have often followed the line of pragmatic naturalists such as Quine and Rorty and rejected the “correspondence theory of truth”,<sup>113</sup> they seem just as often to forget the serious demands one has to meet when adopting an alternative *coherence theory*. It behoves the pragmatic naturalist to make sure that whatever he claims is in coherence with the best available knowledge in all other fields of knowledge – the scholars’ “ethnos”, to use Rorty’s term.<sup>114</sup> This is, after all, how “truth” is evaluated once the representational theory is abandoned: it becomes a matter of finding one’s rightful place in the broader “holistic” structure of human knowledge.

The naturalistic position that this project is based on thus assumes that all of human existence, activity, and experience is part of nature, and therefore ought to be

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<sup>110</sup> See e.g. Steven Pinker, *The Blank Slate*.

<sup>111</sup> See e.g. Slingerland, *What Science Offers the Humanities*.

<sup>112</sup> The term is inspired by Aristotle’s distinction between the common opinions of the people (*doxa*) and the argumentatively tested and durable “good opinions” of the wise (*endoxa*). The endoxic principle recognises that the scholar cannot be expected to personally master all the sciences that inform his or her own work. Instead, an effort must be made to listen to those who are presumed to have the most valued opinions in any field.

<sup>113</sup> For an example, see Kocku von Stuckrad, ‘Discursive Study of Religion: From States of the Mind to Communication and Action’, 257-258.

<sup>114</sup> This is the undeniable practical consequence of Quine’s “semantic holism”, but it also appears to be a feasible end result of Richard Rorty’s “ethnocentrism”. See especially Rorty, ‘Solidarity or Objectivity?’.



explained with reference to the totality of knowledge concerning nature.<sup>115</sup> On this view, social constructions emerge within the natural world, knowledge about which is already assumed through the many branches of science. Rather than explaining (away) “scientific knowledge”, social constructions are themselves ultimately rooted in and explained by human nature.

### CONCLUSION: THE CONSTRUCTION AND INVERSION OF A WORLDVIEW

In the course of the chapter we have noted some affinities concerning the notion of “scientific worldviews” and specific ideologies of science. It was the notion that a disenchanted scientific worldview had been imposed on unwilling and dissatisfied citizens that sparked the quixotic polemic against degenerate modern society found in

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<sup>115</sup> This statement contains a rejection of so-called “methodological agnosticism”, which has at times been a popular position in post-phenomenological history of religion. In his classic constructionist study of religion, *The Sacred Canopy*, Peter Berger insisted that ‘every inquiry into religious matters that limits itself to the empirically available must necessarily be based on a “methodological atheism”’ (p. 100, but cf. p. 180). To him, this meant that any and all ‘metahuman explanations must be bracketed, put aside’ (Berger, *The Heretical Imperative*, 36). Note that this “setting aside” is more than simply suspending belief: it means that any phenomenon ascribed religious meaning should be explained as far as it goes from the bottom up; that is, resting entirely on human, social, constructionist explanations. It was in critical discussion with Berger that Ninian Smart first introduced the notion of a “methodological agnosticism” in the study of religion in 1973 (Smart, *The Science of Religion and the Sociology of Knowledge*). For later attempts at revision in a softer, “agnostic” direction, see Douglas V. Porpora, ‘Methodological Atheism, Methodological Agnosticism, and Religious Experience’. The methodological *naturalism* which is proposed here is closer to Berger’s original formulations in that it simply sees any non-natural explanations that we may encounter on the emic level as irrelevant (except, of course, as data for interpretation and explanation). Furthermore, it means that any explanation which is not in accord with our best present knowledge of how the world works (i.e., what our colleagues in the relevant disciplines considers to be plausible), or which lacks any plausible support by such knowledge, is also automatically disqualified from the accounting of things. This methodological discussion is alive in contemporary science of religion: see especially the important recent volume on philosophy of science in the study of religion edited by Torben Hammersholt & Caroline Schaffalitzky (eds.), *At kortlægge religion*. The volume contains three articles which define a methodological naturalism, and attack the agnostic position on epistemological and methodological grounds. See Asbjørn Dyrendal & Olav Hammer, ‘Hvad kan man vide om religion?’; Jesper Sørensen, ‘Religionskritik og religionsvidenskab’; Hammersholt, ‘Ninian Smarts mystikforskning som videnskabsteoretisk case’.

Morris Berman and David Ray Griffin. At the same time, however, we have seen a positive attempt to create and spread a worldview based on contemporary science among the Victorian naturalists. This worldview, moreover, has certain resemblances with notions of “disenchanted science”. The methodological and theoretical reflections introduced above let us connect these observations in a coherent thesis about the *construction* and polemical *inversion* of worldviews.

As seen in the section on naturalism, the circle around Huxley, Tyndall, Spencer, et al., largely succeeded in constructing and launching a scientific worldview which appeared consistent, gained currency in influential circles of politics and culture, and became something of an official view of “what science dictates” on topics of broader societal relevance. Earlier, I talked about this event as the *ideological settlement* of Victorian scientific naturalism;<sup>116</sup> it amounted to a worldview that was proliferated through popular science, newspaper columns, public lectures, and increasingly through the reformed educational system. In this sense, new generations were socialised into the Victorian naturalist worldview.

This did not mean that everyone *accepted* that worldview, not even if we look among those who pursued academic careers.<sup>117</sup> It is for example notable that, with a few important exceptions, Victorian *physics* was a place where the naturalistic worldview was often met with some suspicion. The physicists’ attitude typically came from a combination of philosophical, religious and strictly scientific reasons: the worldview promulgated by the naturalists tended to be based on understandings of physical concepts that physicists themselves considered outdated, inaccurate, or simply insufficient for supporting the naturalists’ purposes. One of the most important examples concerned “materialism”: the naturalists tended to follow definitions of matter that were rather contested in Victorian physics, including a Daltonian atomic theory that was already on its way out by the 1870s.<sup>118</sup> Nevertheless, the worldview itself did have a wider cultural impact, and by the beginning of the 20<sup>th</sup> century it existed pretty much as a “received view” of what science was up to, how it understood the world and human beings, and how it was related to questions of religious

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<sup>116</sup> Luckhurst, *Invention of Telepathy*, 12; cf. Latour, *Pandora’s Hope*, 310.

<sup>117</sup> This is the major thesis argued by Turner, *Between Science and Religion*.

<sup>118</sup> See my discussion of the modern conceptual revolutions in physics and chemistry in chapter four below.

significance.<sup>119</sup> Victorian naturalism was, in other words, a central intellectual backdrop against which early 20<sup>th</sup>-century debates about science and worldview took place.

At this point we should make a connection with the problem of disenchantment. There was a revolt against the Victorian view in the early decades of the new century, fuelled in part by new scientific discoveries, spearheaded by a younger generation that was no doubt trying to define itself contra the previous one. New scientific paradigms were often interpreted in ways which conformed with new and emerging ideologies of science, also presented in opposition to what the old Victorians were thought to have meant. These processes will occupy us in some detail as we discuss the fundamental debates in the special sciences in following chapters, and we should not rush on prematurely. We should, however, ask: what is the connection between the naturalistic worldview at 1900 and the notion of a disenchantment of the world, brought about by science?

We have seen what the Victorian naturalistic worldview implied, and it seems clear that, at least as far as its basic ontology and epistemology is concerned, Victorian naturalism corresponds nicely with the *epistemic* dimension of disenchantment. One of the major points brought up by the worldview's public defenders was indeed to get rid of any fantasies about immaterial agency and other obscurantist ideas about the way the world works, and to redefine the place of humanity within it. The project was built on an ambitious confidence that science would be able to conquer nature completely, leaving nothing unexplained. When we consider the axiological and metaphysical dimensions, however, things become much more ambiguous. Naturalism surely disavowed *speculative* metaphysics that lacked a firm grounding in science, but it was not afraid of tracing the metaphysical *implications* of scientific theories and hypotheses. In fact, such an endeavour must be seen as a necessary prerequisite for creating a coherent worldview in the first place. The possibility of developing an axiological discourse on the basis of natural science is even more clearly present in Victorian naturalism. Although allegations about "social Darwinism" have often taken the form of moral outrage against a barbaric form of *laissez-faire* egoism applied to society at large, or alternatively to the worship of the strong and fit at the expense of the weak,<sup>120</sup> this is

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<sup>119</sup> See e.g. Peter Bowler, *Reconciling Science and Religion*, 14-24.

<sup>120</sup> This strongly coloured usage can be traced to Richard Hofstadter's 1944 book, *Social Darwinism in American Thought*. The book used the term to attack fascist ideology and currents the author considered

entirely a rhetorical invention of the mid-20<sup>th</sup> century that eclipses the fact that there were great differences between the various ways in which authors, philosophers, politicians and scientists attempted to make the various theories of evolution to bear on ethics and the ordering of society. Herbert Spencer's vision was indeed one of *laissez-faire* liberalism (although it is less clear how much support he drew from evolutionary thinking on this particular issue), while Huxley tended to emphasise the moral worth of nature itself, and of all living organisms, prefiguring the ecological discourse that would later become so popular among the re-enchantment theorists.<sup>121</sup> Furthermore, while Spencer's view emphasised free-market competition and a diminishing influence of the state, Huxley spent most his life trying to increase the state's functions, and improve them through the application of science. Huxley's lectures on evolution and ethics may be seen as a precursor to the biologically oriented type of naturalised ethics that is still a concern of professional philosophers today.<sup>122</sup>

In short, the naturalistic scientific worldview at the entry of the 20<sup>th</sup> century did claim to provide a foundation for ethics and a modest metaphysics, while it was fuelled by an epistemic optimism consistent with disenchantment. We should also remember that this worldview was constructed by a relatively limited number of public spokespersons for science (above all the nine members of the X-Club), and is hence no nebulous, structural, or repressive "system". Being built by a few individuals to serve their immediate ends and aspirations, Victorian naturalism in fact portrayed a somewhat simplified and, one has to say, overly coherent picture of what 19<sup>th</sup> century science was all about, a picture that many natural scientists did not in fact adhere to.<sup>123</sup> The importance of this observation is that the naturalists also created the basic framework for a *myth* of Victorian science, which would be turned on its head by later generations and made to form the foundation of narratives that saw science as a fully disenchanted, reductionist, materialist, and spiritually desolate force in the world. In

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to be crypto-fascist. Projecting this conception backwards on the Victorian naturalists would constitute a highly problematic anachronism. Cf. Thomas C. Leonard, 'Origins of the Myth of Social Darwinism'.

<sup>121</sup> See Michael Ruse, 'Introduction', xviii-xix.

<sup>122</sup> Thomas H. Huxley, *Evolution & Ethics*.

<sup>123</sup> On the scientific and academic reaction to scientific naturalism, see especially Turner, *Between Science and Religion*. For the debate in Victorian physics and theories of matter, see Aspem, 'Pondering Imponderables'.

other words, a construction originally made to serve the interests of the new scientific profession was inversed and projected anew from a standpoint of opposition.

As we shall see in later chapters, this is a central aspect of the dynamic involved in the creation of what I term “emic historiographies of science”, attaching extra-scientific hopes of eschatological dimensions to certain early-20<sup>th</sup> century scientific advances. The re-enchantment advocates that we met at the beginning of this chapter were only a late addition to this tendency. In the chapters that lie ahead of us, we shall see that a number of emic historiographies and worldview implications of science were constructed in the decades between 1900 and the Second World War. Moreover, these were intricately interwoven with the creation of new scientific conceptual structures and the rise of new generations of researchers. Even when they were motivated by strictly scientific concerns, they could not escape the broader cultural contexts in which they practiced science, and were often led to address worldview questions against the backdrop of their immediate surroundings. In what follows, we shall move to the fundamental debates in the sciences of physics, chemistry, biology, and psychology during the turbulent decades of the early 20<sup>th</sup> century, charting a number of diverging contexts and a broad gallery of actors united by their attempts to make sense of the world while treading the outer limits of rational knowledge.