

- 74 This argument is already prefigured in Lange, *Geschichte des Materialismus*, p. 490, where he describes subjectivity as a 'Fiktion', an 'Ideen-Association' or as a 'Verschmelzung der Sinneswahrnehmungen'.
- 75 See Stephen Toulmin, 'The Inwardness of Mental Life', *Critical Inquiry*, 6 (1979), 1–16.
- 76 See Alexander Nehamas, *Nietzsche: Life as Literature* (Cambridge, MA: Harvard University Press, 1985), p. 181.
- 77 See Bain, *Mind and Body*, pp. 41, 43, 117, 143 and 196.

Chapter 5

Reading Nietzsche through Ernst Mach¹

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Nietzsche has often been taken as presenting us with a radical attack on the pretensions of science and reason. Such readings focus on particular strains within the Nietzschean corpus: his perspectivism, his insistence that scientific theories involve falsification, and his claims that scientific theories are merely interpretations of the world. Those who oppose such readings of Nietzsche point instead to his favourable comments about science, scientific methodology, the results of particular sciences, the role of scientists and the importance of the senses. Various science-friendly labels – materialist, empiricist, positivist, naturalist – fly thick and fast in the hope that some of them, or some version of them, will stick to Nietzsche.²

However it is often not quite clear what these labels come to – what, in other words, would have to be true of Nietzsche's views in order for him to deserve one label rather than another. There are at least three obvious dimensions of claims that are relevant here: epistemological claims, metaphysical claims and claims in the philosophy of language. There are also significant ways in which the cluster of claims that falls under a particular label has changed through time. Think for a moment of the range of philosophers that might fall under a heading for 'positivism' in an encyclopaedia – Saint-Simon, Comte, Bentham, J.S. Mill, Avenarius, Popper – but, of course, crucially different claims are being made by these different thinkers despite whatever relative continuity and family resemblances may exist.

Furthermore, if we take into consideration the German context in which Nietzsche is writing, we must add – at the very least – sensualism to our list of science-friendly views. This should remind us that we need in particular to watch for the slide from epistemology to metaphysics. The empiricist claim that the senses are the only source of information about the world is, or at least was and is often taken to be, compatible with a range of views in metaphysics. Indeed an empiricist epistemology does not, or again was not taken to, commit one to an empiricist semantics. Transcendental idealism and the endless neo-Kantian variations on the theme only make the picture more complicated. Most of the views that labelled themselves, or have been labelled, as Kantian and neo-Kantian could, in all sincerity, express admiration for the sciences and the senses.

One strong strain in contemporary Anglo-American Nietzsche scholarship would like to take his positive emphasis on the senses, nature and scientific methodology as grounds for interpreting him as similar in many ways to contemporary naturalists. According to such a reading, Nietzsche has a basically empiricist epistemology and has ontological commitments that are more or less straightforwardly read off of whatever he takes to be the best empirically supported account of the world. This

interpretation is assumed to gain support from the pervasive influence of materialism in the mid to late nineteenth century.³

However, this view does run into some problems. On the one hand, Nietzsche often suggests that the theories of scientists indeed do not straightforwardly report how the world is. Thus he says:

It is perhaps just dawning on five or six minds that physics, too, is only an interpretation and exegesis of the world (to suit us, if I may say so!) and *not* a world-explanation; but insofar as it is based on belief in the senses, it is regarded as more, and for a long time to come must be regarded as more – namely, as an explanation. (BGE 14)

Or consider the following passage:

One should not wrongly reify ‘cause’ and ‘effect’, as the natural scientists do (and whoever, like them, now ‘naturalizes’ in his thinking), according to the prevailing mechanical doltishness which makes the cause press and push until it ‘effects’ its end; one should use ‘cause’ and ‘effect’ only as pure concepts, that is to say, as conventional fictions for the purpose of designation and communication – *not* for explanation. In the ‘in-itself’ there is nothing of ‘causal connection’, of ‘necessity’, or of ‘psychological non-freedom’; there the effect does *not* follow the cause, there is no rule of ‘law’. It is *we* alone who have devised cause, sequence, for-each-other, relativity, constraint, number, law, freedom, motive, and purpose; and when we project and mix this symbol world into things as if it existed ‘in itself’, we act once more as we have always acted – *mythologically*. (BGE 21)

Brian Leiter suggests that this passage and other passages are only a stage in Nietzsche’s development and points to Maudemarie Clark’s work to suggest that, in the end, one doesn’t have to ascribe an anti-naturalist position to Nietzsche.⁴ Clark gives us a developmental interpretation of Nietzsche and claims that in the end Nietzsche does not accept the falsificationist claims of the kind suggested by the quoted passages.⁵

I find the claim that Nietzsche gives up on the falsification thesis hard to swallow. My aim here, though, will not be to argue that we should ascribe the falsificationist thesis to the later Nietzsche but rather to suggest an alternative reading of Nietzsche that is both science-friendly and allows for a falsificationist thesis. This alternative reading of Nietzsche uses the fact that there were, as I have already suggested, many different ways in which Nietzsche’s contemporaries could be friendly to science and the senses. Building on Thomas Brobjer’s remarks on Nietzsche’s reading of Mach and Avenarius in Chapter 1 of this volume, I shall argue that it is Ernst Mach’s neutral monism – Machian positivism, as I will call it – that provides the basis for the correct interpretation of Nietzsche’s published texts on central metaphysical and epistemological issues.

The argument will be perforce partial but I hope that, by deploying a set of different kinds of argument, a convincing initial case can indeed be made. First, I will look at how Nietzsche situated his own epistemology and metaphysics in the section ‘How the “True World” Finally Became a Fable’ in *Twilight of the Idols*. Here Nietzsche lists a progression of historical positions on the relation between the world of our experiences and some purported real, or more real, world. He correctly sees these positions as linked by natural conceptual developments. These

developments that supposedly lead to Nietzsche’s own position also lead, I will argue, for exactly the same reasons, to Mach’s position. This should give us some reason to suspect that Mach’s more systematically laid-out position might help us make sense of Nietzsche’s more cryptic remarks. Of course, the first argument will not be effective if there is no actual textual support in Nietzsche for the Machian reading and so I will turn to citing and discussing relevant passages from Mach’s and Nietzsche’s works. Then I shall move on to a consideration of the evidence available for a causal connection between the two. My claim will be that Mach’s views, and some very much like them, were quite widespread and influential. This claim receives support, as I shall try to show, from the similarities many contemporaries noticed between Nietzsche’s views and those of contemporary positivists like Mach. Finally, I shall try to show how reading Nietzsche through Mach actually helps us to interpret Nietzsche by considering in detail section 15 of *Beyond Good and Evil*, a passage central to understanding Nietzsche’s views on the senses and their epistemic role. Reading this passage through Mach provides a framework for an interpretation that manages to account for the many complexities of the passage that are otherwise hard to deal with.

Nietzsche and Positivism

When it comes to Nietzsche’s fundamental views on metaphysics and epistemology, what are the interpretative possibilities suggested by Nietzsche’s historical context? Recall my laundry list of labels: empiricism, materialism, naturalism, positivism and sensualism, not to mention all the varieties of neo-Kantianism. Does Nietzsche himself give us a clue as to where he might fit within these contemporary views? He supposedly does precisely this in the passage from the *Twilight of the Idols* entitled ‘How the “True World” Finally Became a Fable: The History of an Error’. Let me quote the final few stages of this history:

4. The true world – unattainable? At any rate, unattained. And being unattained, also *unknown*. Consequently, not consoling, redeeming, or obligating: how could something unknown obligate us?
(Grey morning. The first yawn of reason. The cockcrow of positivism.)
5. The ‘true’ world – an idea which is no longer good for anything, not even obligating – an idea which has become useless and superfluous – *consequently*, a refuted idea: let us abolish it!
(Bright day; breakfast; return of *bon sens* and cheerfulness; Plato’s embarrassed blush; pandemonium of all free spirits.)
6. The true world – we have abolished it. What world has remained? The apparent one perhaps? But no! *With the true world we have also abolished the apparent one*.
(Noon; moment of the briefest shadow; end of the longest error; high point of humanity; INCIPIIT ZARATHUSTRA.) (TI ‘World’)

There are a few obvious initial reactions one might have: (1) stage 4 certainly is supposed to have something to do with positivism; (2) stages 5 and 6 may involve further developments of positivism; (3) Nietzsche presumably sees himself as representing stage 6.

So, now, if we turn to Nietzsche's historical context what do we find? Who are the positivists? And are there positions, so to speak, beyond positivism? And would any of these positions fit with the rest of Nietzsche's texts – in particular, his claims about the senses, science and falsification?

In Nietzsche's immediate historical context, positivism, both as philosophical and social movement, was associated with Auguste Comte (1798–1857). Comte argues that the human mind goes through 'three different theoretical states: the theological or fictitious state, the metaphysical or abstract state and the scientific or positive state'.⁶ It is this last state that Comte wants to endorse:

[T]he human mind, recognizing the impossibility of obtaining absolute truth, gives up the search after the origin and hidden causes of the universe and a knowledge of the final causes of phenomena. It endeavors now only to discover, by a well-combined use of reasoning and observation, the actual laws of phenomena – that is to say, their invariable relations of succession and likeness.⁷

Everybody, indeed, knows that in our positive explanations, even when they are most complete, we do not pretend to explain the real causes of phenomena.⁸

Positivism is understood as the rejection of trying to go beyond the phenomenal reality we have access to. John Stuart Mill describes the Comtean positivist position as follows:

We have no knowledge of anything but Phænomena; and our knowledge of phænomena is relative, not absolute. We know not the essence, nor the real mode of production, of any fact The laws of phænomena are all we know respecting them. Their essential nature, and their ultimate causes, either efficient or final, are unknown and inscrutable to us.⁹

Now we can see in this positivist position, some of the themes we see in Nietzsche: the importance of the senses, the emphasis on studying the observable world, and the recommended alliance of philosophy with the natural sciences.¹⁰

But positivism, in this sense of the term, is a stage that Nietzsche takes himself to be going beyond. The Comtean positivist still accepts the distinction between the true world – the thing-in-itself – and the world of appearances – the phenomenal world. The Comtean positivist, however, simply thinks that there is no point in thinking about the thing-in-itself. Thus the Comtean positivist naturally falls under stage 4.¹¹

Now, stages 5 and 6 go beyond stage 4. In stage 5 we abolish the 'true' world and in stage 6 we realize that 'with the true world we have also abolished the apparent one' (*TI* 'World'). Who in Nietzsche's historical context would be a natural successor to Comte? I want to argue that the natural successor most helpful for interpreting Nietzsche's own position is Ernst Mach (1838–1916) and, we should, I suggest, hardly be surprised to learn that Nietzsche owned a copy of Mach's *Contributions to the Analysis of the Sensations* (1886).¹²

Textual Evidence

I will turn in the next section to a more detailed discussion of Nietzsche's historical context and the place of Mach's views in his intellectual milieu. However, it makes sense to consider first the evidence presented by the texts themselves. In this section I will briefly survey the similarities between Mach's and Nietzsche's views on central epistemological and metaphysical issues. We shall return to some of these issues in the very last section of this chapter when I argue that reading Nietzsche through Mach helps us understand what would otherwise be problematic passages in the Nietzsche corpus.

So what does Mach say? An autobiographical footnote in Mach's *Analysis of Sensations* should remind us immediately of Nietzsche's 'How the "True World" Became a Fable'. Mach writes:

I have always felt it as a stroke of special good fortune, that early in life, at about the age of fifteen, I lighted, in the library of my father, on a copy of Kant's *Prolegomena zu jeder künftigen Metaphysik* [*Prolegomena to Any Future Metaphysics*]. The book made at the time a powerful and ineffaceable impression upon me, the like of which I never afterward experienced in any of my philosophical reading. Some two or three years later the superfluous rôle played by 'the thing in itself' abruptly dawned on me. On a bright summer day under the open heaven, the world with my ego suddenly appeared to me as *one* coherent mass of sensations, only more strongly coherent in the ego.¹³

Mach lays out his basic metaphysical picture in the introductory chapter of *Contributions to the Analysis of the Sensations*. He defends a monism according to which the world consists of sensations.¹⁴ But he prefers calling these sensations 'elements' to emphasize that they are not to be understood as belonging to some particular self – or, in his terms, ego – and because they are the most basic building blocks – elements – of the world: 'The primary fact is not the *I*, the ego, but the elements (sensations). The elements *constitute* the *I*. *I* have the sensation green, signifies that the element green occurs in a given complex of other elements (sensations, memories)'. There is thus a field of sensory elements in which certain relatively stable complexes are given single designations, single names: 'Our greater intimacy with this sum-total of permanency, and its preponderance as contrasted with the changeable, impel us to the partly instinctive, partly voluntary and conscious economy of mental representation and designation, as expressed in ordinary thought and speech.' But the 'useful habit of designating such relatively permanent compounds by *single* names, and of apprehending them by *single* thoughts' leads us to make the mistake of thinking that there is 'a *single* thing with many attributes'. Thus also 'arises the monstrous notion of a *thing in itself*, unknowable and different from its "phenomenal" existence'.¹⁵ And indeed we make this mistake about the particular complex that we label as the ego, *das Ich*.

Crucially, everything is, so to speak, on one ontological plane:

Let those complexes of colors, sounds, and so forth, commonly called bodies, be designated, for the sake of simplicity, by *A B C* ...; the complex, known as our own body, which constitutes a part of the former, may be called *K L M* ...; the complex composed of volitions, memory-images, and the rest, we shall represent by $\alpha \beta \gamma$ ¹⁶

As soon as we have perceived that the supposed unities 'body' and 'ego' are only makeshifts, designed for provisional survey and for certain practical ends ..., we find ourselves obliged, in many profound scientific investigations, to abandon them The antithesis of ego and world, sensation phenomenon and thing, then vanishes, and we have simply to deal with the *connexion* of the *elements* $\alpha \beta \gamma \dots A B C \dots K L M \dots$ ¹⁷

As Mach emphasizes, '*the senses represent things neither wrongly nor correctly. All that can be truly said of the sense-organs is, that, under different circumstances they produce different sensations and perceptions*'.¹⁸ Mach's illustration of this point makes things clearer:

A cube of wood when seen close at hand, looks large; when seen at a distance, small; it looks different with the right eye from what it does with the left; sometimes it appears double; with closed eyes it is invisible. The properties of the same body, therefore, appear modified by our own body; they appear conditioned by it. But where, now, is the *same* body, which to the appearance is so *different*? All that can be said is, that with different *K L M* different *A B C* ... are associated.¹⁹

Now, my aim is not, in the end, to defend the coherence, or the plausibility, of Mach's sensory element monism. However, for those familiar with many of the relevant Nietzschean texts, much here should have rung various bells.

Nietzsche makes similar points about the senses. He attacks most of traditional philosophy for having taken the senses as the basis of all deceptions and confusions in philosophy (*TI* 'Reason' 1). Instead, he pays tribute to Heraclitus:

With the highest respect, I except the name of *Heraclitus*. When the rest of the philosophic folk rejected the testimony of the senses because they showed multiplicity and change, he rejected their testimony because they showed things as if they had permanence and unity. Heraclitus too did the senses an injustice. They lie neither in the way the Eleatics believed, nor as he believed – they do not lie at all. What we *make* of their testimony, that alone introduces lies; for example, the lie of unity, the lie of thinghood, of substance, of permanence. (*TI* 'Reason' 2)

The senses do not lie. It is our language, and reasoning, that can lead to confusion. We can see Nietzsche's position as a somewhat more radical version of the Machian account: Mach talks of natural tendencies to get confused by the usefulness of designating things with single names; Nietzsche will talk about inevitable falsification brought on by language. Mach's language is certainly gentler than Nietzsche's. Compare Mach:

If, to the physicist, bodies appear the real, abiding existences, whilst sensations are regarded merely as their evanescent, transitory show, the physicist forgets, in the assumption of such a view, that all bodies are but thought-symbols for complexes of sensations (complexes of elements).²⁰

And Nietzsche:

Formerly, alternation, change, any becoming at all, were taken as proof of mere appearance, as an indication that there must be something which led us astray. Today, conversely,

precisely insofar as the prejudice of reason forces us to posit unity, identity, permanence, substance, cause, thinghood, being, we see ourselves somehow caught in error, compelled into error 'Reason' in language – oh, what an old deceptive female she is! I am afraid we are not rid of God because we still have faith in grammar. (*TI* 'Reason' 5)

But despite the difference in tone, the point is essentially the same. Language, and conscious reasoning that must occur in language, misleads, and thus claims about the world, expressed as they must be in language, tend to mislead (Mach) or necessarily falsify (Nietzsche). As Mach says elsewhere:

Language, with its helpmate, conceptual thought, by fixing the essential and rejecting the unessential, constructs its rigid pictures of the fluid world on the plan of a mosaic, at a sacrifice of exactness and fidelity but with a saving of tools and labor.²¹

Compare this to one of Nietzsche's notes:

A concept is an invention that doesn't *completely* correspond; but a lot of it does correspond a little: a sentence such as 'two things that are identical to a third are identical to each other' presupposes 1) things 2) identities: both don't exist. But with this invented rigid concept- and number-world man gains a means to grasp a huge quantity of facts with symbols and imprint them in memory. This symbol-apparatus is his superiority precisely because it distances him as far as possible from the individual facts. The reduction of experiences to *symbols*, and the increasing quantity of things which can therefore be grasped, is his *highest power*. The mental as the ability to be a master through symbols of a huge quantity of facts. *This mental world, this symbol-world, is sheer 'appearance and deception'*, just as every 'thing of appearance' already is. (*KSA* 11, 34[131])

Sometimes, in fact, the language they use is almost exactly the same. Mach quotes with approval a famous aphorism from Lichtenberg emphasizing that one should say 'It thinks' rather than 'I think' – a point that Nietzsche makes without explicit reference to Lichtenberg in *BGE* 17.²² Similar comparisons can be made between Nietzsche's comments on atomism in the rest of *BGE* 17 and Mach's view of atomism.²³

Perhaps as important as these clearly shared philosophical positions are the places where Mach's views can provide insight into what are otherwise opaque Nietzschean doctrines. A Machian reading of Nietzsche gives us various possibilities for accounting for talk of perspective: the first is the visual way – namely, to use Mach's language, 'with different *K L M* different *A B C* ... are associated'; second, we can take talk of perspective to be essentially talk of interpretation. Within a Machian reading an interpretation of the world, and thus a perspective on the world, is a theory of the world that sets up names for particular clusters of sensory elements and the relations they stand in. Such interpretations in general will involve falsification, since grammar misleads us, perhaps necessarily, to think that our theory refers to objects and picks out explanatory causal relations. A particular claim can be false in a way that can be distinguished from this general falsification: consider the term – the name, as Mach would say – 'desk' that I use to pick out the cluster of mostly brownish elements in front of me. The claim 'There is a desk in front of me' falsifies in that at least 'desk', 'me' and perhaps even 'in front of' involve commitments that go beyond the facts – that go beyond what is

indeed true of the sensory elements. The sentence says too much, but part of what it says gets things right. The claim 'There is a desk on top of me' gets things even more wrong and fails drastically for the purposes of, as Nietzsche says, 'designation and communication' and, of course, life (*BGE* 21). Interpretations can thus certainly vary in the degree to which they get the sensory elements right. As Nietzsche would, of course, remind us, getting it right in any case isn't everything. Standard physics and an account of the world in terms of the will to power would be two ways of interpreting the world – two ways of lumping together complexes and picking out relations between complexes – and perhaps even two ways that get things right about equally. But one could always have other grounds for choosing between them.

Historical Context

The suggestions that there are parallels between the ideas of Mach and Nietzsche and that Mach may indeed have influenced Nietzsche have both been made before. In his 1902 work *Nietzsches Erkenntnistheorie und Metaphysik*, one of the very first sustained studies of Nietzsche's epistemology and metaphysics, the Austrian philosopher Rudolf Eisler repeatedly mentions the resemblance to Mach, as well as other positivistic thinkers such as Richard Avenarius, Wilhelm Ostwald and John Stuart Mill.²⁴ Indeed, he makes clear in his foreword to the book that it was partly the correspondences between 'the "Positivism" of thinkers like E. Mach, W. Ostwald among others which made a critical investigation of Nietzsche's epistemology and metaphysics particularly interesting.'²⁵

Hans Vaihinger, too, seems to place Nietzsche in the company of Mach and Avenarius. Vaihinger saw Nietzsche as one of his most important predecessors in the cause of his, Vaihinger's, 'idealistic positivism'.²⁶ In explaining why *The Philosophy of 'As if'* was not published until 1911, despite his having written much of it by the end of the 1870s, Vaihinger gives four reasons why his work could now be introduced and understood: (1) the dissemination of voluntarism (that is, the primacy of the will over the intellect); (2) Mach's and Avenarius's insistence on analysing mental processes in terms of their usefulness for the biological life of organisms and their reduction of things and events to sensory elements; (3) 'the philosophy of Friedrich Nietzsche'; and (4) the spread of pragmatism.²⁷ Vaihinger does not explicitly ascribe the Machian position to Nietzsche here, but it is clear that he saw the similarities between the two positions.²⁸

But the most extensive discussion of the correspondences between Nietzsche's ideas and the positivism of Mach and Avenarius occurs in the work of Hans Kleinpeter (1869–1916). He was what one might reasonably call a follower of Mach. His book, *Der Phänomenalismus* (1913), popularized Mach's philosophical views and placed them within a philosophical tradition of phenomenalism. He examined the parallels between Nietzsche's and Mach's views in extensive detail both throughout his book and in several articles; before publishing his observations, he had even written to Mach himself to point out the kinship.²⁹ Indeed, the similarities that Kleinpeter notices are basically the ones I have emphasized above in arguing for the helpfulness of seeing Nietzsche through a Machian perspective. Kleinpeter also suggests that Nietzsche may have been reading Mach; in a letter to

Mach dated 9 November 1912, he writes: 'I received the news from Weimar, that Nietzsche read one of your essays in a scientific journal in 1885 and spoke very favourably about it.'³⁰ In his book he writes that Elisabeth Förster-Nietzsche had personally informed him that when Nietzsche first read Mach, he immediately recognized in Mach a likeminded thinker (*Gesinnungsgenosse*).³¹

Philipp Frank, the physicist and founding member of the Vienna Circle, also emphasized the affinity between Nietzsche and Mach. Frank finds the 'striking agreement' in their epistemological and metaphysical views even more impressive given the sharp contrast in their ethical views.³²

Not surprisingly, then, John Blackmore, in his biography of Mach, finds it necessary to mention the fact that writers like Kleinpeter and Frank had noticed the similarities between the thought of Mach and Nietzsche, and agrees that both are 'epistemological phenomenologists'.³³ Blackmore, though, is at pains to stress some differences, and I think it is worth taking a moment to consider these. First, Blackmore claims that 'Mach treated sensations as facts and Nietzsche suspected they were only interpretations'.³⁴ The Nietzsche text which Blackmore cites is the following:

Against positivism, which halts at phenomena – 'There are only facts' – I would say: No, facts is precisely what there is not, only interpretations. We cannot establish [*feststellen*] any fact 'in itself': perhaps it is folly to want to do such a thing. 'Everything is subjective,' you say; but even this is *interpretation*. The 'subject' is not something given, it is something added and invented and projected behind what there is. – Finally, is it necessary to posit an interpreter behind the interpretation? Even this is invention, hypothesis.

In so far as the word 'knowledge' has any meaning, the world is knowable; but it is *interpretable* in other ways, it has no meaning behind it, but countless meanings – 'Perspectivism'. (*KSA* 12 7[60])

The use of *feststellen* suggests that Nietzsche is making a claim about *our* ability to establish and state some fact about the world and not about the nature of the world itself. Given the nature of language, and given in particular the nature of concepts, a positivism that took our most fundamental statements about the phenomena to be fully and accurately stating the facts about the phenomena would indeed be mistaken. But, as I've tried to show already, this is not a view that we should ascribe to Mach either. And for both Nietzsche and Mach, the world, even if we cannot simply state the facts but can only interpret the world, is still knowable.

The second difference emphasized by Blackmore is the difference in ethical outlook. Here I think Blackmore is right. In one of his very few published references to Nietzsche, Mach makes a disparaging remark about Nietzsche's 'overweening [*frechen*] *Übermensch* at one point in the later editions of his *Analysis of Sensations*.³⁵ (Since it is not in the first edition, Nietzsche would not have seen this comment.) Karl Heller suggests that Mach may well have changed the negative opinion expressed here under the influence of Kleinpeter.³⁶ This seems implausible and is probably unsupported. It is implausible because Kleinpeter appears to be trying to convince Mach that Nietzsche shares Mach's views on the self, on the knowledge and existence of things in themselves, on sensations as metaphysically and epistemologically primary and so on; but surely Mach could accept Nietzsche's agreement with him on these points without changing his opinion of Nietzsche's

Übermensch. The claim is unsupported because we do not actually have Mach's letters to Kleinpeter, and Heller is trying to reconstruct Mach's views from guesses about what Kleinpeter must be responding to in Mach's letters.³⁷ Heller may well be drawing on his knowledge of all the letters from Kleinpeter to Mach in the Ernst-Mach-Institut in Freiburg; however, the letters from which he quotes only show that Mach had not read, or had hardly read, Nietzsche before Kleinpeter mentioned him and perhaps that Mach had alluded to Nietzsche's unfavourable reputation. Heller quotes the following lines from Kleinpeter in order to show that Mach must have admitted in a previous letter that he had been unfair to Nietzsche: '*I have had exactly the same experience with Nietzsche. Until recently I hadn't read a single sentence by him.* But I have found him to be much better than his reputation would lead one to think'.³⁸ Kleinpeter then goes on to repeat his view that Nietzsche, like Mach, wants to base everything on sensations. None of this suggests any acceptance by Mach of Nietzsche's ethical views.

I should emphasize that explicit evidence that Nietzsche specifically had Mach in mind is not easy to come by. We should remember that, though Nietzsche does not often publicly acknowledge his debt to other thinkers, this does not mean that there was not a significant influence; consider, for example, the case of Friedrich Lange. Mach's book wasn't published until 1886 and, even assuming that Nietzsche immediately got his hands on it, it could presumably only directly influence *Beyond Good and Evil* and subsequent books. In Chapter 1 of this volume Thomas Brobjer points out that Nietzsche sent Mach his *Zur Genealogie der Moral* at the end of 1887, suggesting that he read Mach that year. Much of what is explicitly laid out in Mach's *Contributions to the Analysis of the Sensations* was, however, already present in his earlier work and in many of his public lectures. Indeed, in the book he points back to this earlier work.

Consider one example. At the end of the long footnote describing his reactions to Kant's *Prolegomena* quoted above, Mach mentions contemporaries such as Avenarius who share his *Empfindungsmonismus* and then refers back to his paper 'Ueber die ökonomische Natur der physikalischen Forschung'.³⁹ This was originally an 'address delivered before the anniversary meeting of the imperial Academy of Sciences, at Vienna, 25 May, 1882' and was then published in 1882 in the *Almanach der Wiener Akademie*. There Mach summarizes his theory of elements. In a footnote to this summary, he continues as follows:

I have represented the point of view here taken for more than thirty years and developed it in various writings (*Erhaltung der Arbeit*, 1872, parts of which are published in the article on *The Conservation of Energy* in this collection; *The Forms of Liquids*, 1872, also published in this collection; and the *Bewegungsempfindungen*, 1875).⁴⁰

Indeed, correctly or incorrectly, Mach takes his monism to be a view shared by many other contemporaries in their 'allied thoughts'.⁴¹

So I think there is quite a bit of support for the claim that both Mach's view and other similar views were 'in the air' early enough to influence Nietzsche. Of course, part of my claim, and Mach's for that matter, is that his particular brand of empiricism, and the more specific monistic claims it involves, is at least one natural development of certain shared conceptions of the role of sensory evidence and the

nature of scientific theories that were widespread at the time. The crucial issue is still, of course, whether reading Nietzsche through Mach allows us to make sense of his views – and hopefully more sense than competing interpretations.

A Machian Reading of *Beyond Good and Evil* §15

So does reading Nietzsche through Mach help us make sense of otherwise opaque passages? In this final section I will consider one particular passage, section 15 of *Beyond Good and Evil*, in detail:

To study physiology with a clear conscience, one must insist that the sense organs are *not* phenomena in the sense of idealistic philosophy; as such they could not be causes! Sensualism, therefore, at least as a regulative hypothesis, if not as a heuristic principle.

What? And others even say that the external world is the work of our organs? But then our body, as a part of this external world, would be the work of our organs! But then our organs themselves would be – the work of our organs! It seems to me that this is a complete *reductio ad absurdum*, assuming that the concept of a *causa sui* is something fundamentally absurd. Consequently, the external world is *not* the work of our organs – ?

Successfully interpreting this passage is clearly fundamental to understanding Nietzsche's metaphysical and epistemological views, including his assessment of the epistemic role of the senses and thus the status of empirical science. It is, however, just as clear that it is not at all obvious how to interpret this aphorism.

Let me note a couple of features of the rhetorical structure of *Beyond Good and Evil* §15. Consider the very first sentence: 'To study physiology with a clear conscience, one must insist that the sense organs are *not* phenomena in the sense of idealistic philosophy; as such they could not be causes!' There are two interesting features of this very first sentence. First, an assertion of what beliefs are needed for someone to study physiology, or rather to do physiology, with a 'clear conscience' – 'Physiologie mit gutem Gewissen zu treiben' – does not require that the asserter actually think that one should have those beliefs. Or, rather, it doesn't require that the asserter think that the relevant beliefs are true. Second, most idealists, particularly the transcendental idealist, would find the claim being made quite peculiar. After all, the domain concerning which causal claims are the most appropriate – the domain for which we are most confident that we understand what we are up to in making causal claims – is precisely that of the phenomenal world. The natural thing to say, if we are speaking in the 'sense of idealistic philosophy', might well be the following: 'We must insist that the sense organs *are* phenomena otherwise they could not be causes (or at least not causes in any sense that we have a clear grip on)!' Nietzsche must surely be putting this sentence in this paradoxical manner on purpose – we are being put on notice that words are being twisted and played with.

The oddity continues in the next sentence: 'Sensualism, therefore, at least as a regulative hypothesis, if not as a heuristic principle.' This only makes the plot thicken. The suggestion clearly is that this claim about sensualism is supposed to follow as a consequence. Sensualism is epistemic empiricism – that is, the claim that all our information about the world comes through the senses. This claim, as Lange

points out, does not, of course, commit one to any particular ontological claims or, for that matter, semantic ones. Thus, even if one accepted sensualism, one could still reject materialism and physiology.

Notice, finally, that the suggestion surely is that there are two arguments in *Beyond Good and Evil* §15, where the second argument is a *reductio* and involves appealing to the absurdity of a *causa sui*. Indeed, the structure of the passage suggests that the first argument *doesn't* involve a *reductio* or *causa sui*. Last but not least, the passage ends with a question rather than an explicit conclusion.

So it would be desirable to have an interpretation that is sensitive to the rhetorical and logical complexity of the passage. I will begin by picking up on a clue in the third sentence: 'What? And others even say that the external world is the work of our organs?' This suggests, I think, that the discussion in the first two sentences – the first argument – concerns a purported 'inner world'. Indeed, I want to read this passage as attempting to break down the distinction between inner and outer world, as another confusion haunting us along with the distinction between phenomena and thing-in-itself.⁴²

Note that the first argument, as I've already suggested, cannot really be an argument against Kant, since phenomena, in Kant's sense, are certainly quite suited to being causes. So talk of inner and the outer probably isn't just talk of Kantian phenomena and noumena. But of course there are materialist and, perhaps, neo-Kantian pictures on which an inner world of representations, themselves not causes, are causally generated by the sense organs. That Nietzsche is presumably taking such positions as a target becomes clear when we notice the similarity between Nietzsche's argument here and Lange's discussion of such materialist positions. Although, as I have suggested, there is no *reductio* obviously being run in this argument, there is nonetheless lurking in the background a *reductio* that Lange runs – a *reductio* that will now sound surprisingly familiar. Lange suggests that the physiology of the sense organs 'leads us to the very limits of our knowledge, and betrays to us at least so much of the sphere beyond it as to convince us of its existence'.⁴³ Now, Lange thinks that although such physiological investigation into the sense organs may look favourable for the materialists – in that it promises to give us a materialistic account of our knowledge of the world – it is in fact deadly. Physiology shows us that the sense organs *don't* show us how the world really is and, indeed, that our very concept of matter may have nothing to do with what is really there in the world.⁴⁴ And thus materialism, as the belief in 'material, self-existent things', is thoroughly undermined: the 'consistently Materialistic view thus changes around, therefore, into a consistently idealistic view'.⁴⁵ Lange draws the following conclusions:

1. The sense-world is a product of our organization.
2. Our visible (bodily) organs are, like all other parts of the phenomenal world, only pictures of an unknown object.
3. The transcendental basis of our organization remains therefore just as unknown to us as the things which act upon it. We have always before us merely the product of both.⁴⁶

He summarizes the chapter by saying:

The senses give us ... *effects* of things, not true pictures nor things in themselves. But to the mere effects belong also the senses themselves, together with the brain and the molecular movements which we suppose in it. We must therefore recognize the existence of a transcendental order of things.⁴⁷

Now, surely Nietzsche must have had this section of Lange in mind when writing *Beyond Good and Evil* §15.⁴⁸ Nietzsche is not, presumably, going to draw the conclusion in favour of a 'transcendental order of things'. What is interesting, and I think crucial, is that Nietzsche doesn't try to block the argument by showing, on physiological grounds, that the senses do in fact show us the way the world is; in other words, he doesn't take on all the physiological arguments for falsification by the sense organs either here or elsewhere. Instead, he argues that on grounds of consistency – my interpretation of 'clear conscience' – the physiologist must accept the sensations as showing us how things are in themselves. Let me summarize what I take the argument to be, inspired obviously by the discussion in Lange:

- (1) According to physiology, the sense organs causally generate an internal world of representations.
- (2) If the sense organs aren't showing me accurately what the external world is like, then my term 'sense organs' refers only to certain representations in the internal world.
- (3) According to physiology, these representations in the internal world are effects not causes.

From (1) and (3),

- (4) The sense organs can't just be representations.

And given (2), we get

- (5) The sense organs must indeed be showing me accurately what the external world is like.

Now (5) is sensualism, just as we need it to be.

As I've suggested earlier, this does not, of course, require that Nietzsche actually accept such a physiological account! Notice that if he did, then he *would* have to deal with the problems raised by physiological arguments for falsification. Hence the fact that he does not suggest that he does not himself intend to endorse physiological claims about the role of the sense organs. This in turn explains the features of the second sentence, which Clark does not deal with – namely, that sensualism is accepted as a 'regulative hypothesis, if not as a heuristic principle'. Here, I take it, Nietzsche is speaking in his own voice, but in his own voice he only accepts it as a 'regulative hypothesis, if not as a heuristic principle' which will guide a certain interpretation of the world where an interpretation of the world is to be contrasted with a 'world-explanation' (*BGE* 14).⁴⁹

This is the contrast emphasized in the preceding §14 of *Beyond Good and Evil* and, later, in §21. Accepting some set of claims, say those of physics, as an interpretation of the world is not to regard them as literally describing the actual structure of reality. They do not actually pick out explanatory structures. Talk of cause and effect should not be used for explanation – that would require that our talk of causation actually pick out some causal relation in the world – rather, 'one should

use “cause” and “effect” only as pure concepts, that is to say, as conventional fictions for the purpose of designation and communication’ (BGE 21). A Machian reading of Nietzsche interprets such claims as reminders that language, including the language of science, falsifies. Once we realize this, we can accept a claim that is part of an interpretation of the world without having to accept that the claim is literally true. Perhaps a truly clear conscience would require believing the claim to be literally true, but nonetheless we do have the option now of accepting it as ‘only an interpretation’ – or as a ‘fiction’.

Even a physiological approach to the world, despite its claims about the senses – the claims Nietzsche would learn from Lange – would, on grounds of consistency, have to take the senses as showing us the way the world really is. Both Lange and Nietzsche are insisting that the sense organs can’t consistently both be causes in the materialist’s sense and fail to show us the way the world is. And, for both Lange and Nietzsche, the way out is to do physiology *without*, so to speak, a good conscience. For Lange, we can do physiology without a good conscience because we can take physiology to apply solely to the phenomenal world and thus the sense organs can happily be causes – but not in the materialist physiologist’s sense of ‘cause’, since the materialist is presenting his theory as a comprehensive account of the world.⁵⁰

For Nietzsche, this is not an option since it rests on a distinction between the thing-in-itself and the phenomenal world. So Nietzsche needs another way out and the passage points to this need, presuming the obvious background in Lange. The Machian account would give him precisely that: a monism of sensory elements allows one to do physiology without a good conscience since one can think of the sense organs as causes – but again not in the materialist physiologist’s sense of ‘cause’. Physiology would be part of the causal interpretation – and thus falsifying interpretation – of the world that is physics.

What has been undermined is the consistency of a view that takes the inner world as generated. And, of course, the Machian account is a view that precisely does not assume that the ‘inner world’ is generated and, indeed, is a view that fits, in its own way, with the conclusion that the senses do show us the way the world is – but not in the physiologists’ sense, of course.

Let us now turn to the second argument in *Beyond Good and Evil* §15. Here we deal with a different claim – the opposite claim to that made in the first argument – namely, that the outer world is the work of our sense organs. ‘Work’ here means ‘causation’. And here, I take it, the target is again a certain kind of contemporary physiologist, perhaps one of those committed to some theory of ‘external projection’.⁵¹ Here, Nietzsche suggests, we are left with *reductio ad absurdum*, namely that we are forced to posit a *causa sui*. This is different from the first argument, since there we were not forced to claim something absurd in itself, but rather ended up with a contradiction in the theory that could be resolved by giving up one or the other of the claims – we were not forced to a conclusion that involved a notion contradictory in itself.

The *reductio* is fairly straightforward so I will not go into it in detail. The interesting feature of the second argument – or rather the second part of the aphorism – is the last question. An obvious response to the *reductio* is to reject the claim that the external world is the work of our organs. One way of rejecting this claim is to *accept* the claim that the external world is *not* the work of our organs.

But I take it that the question at the end of the passage is designed to prevent any straightforward version of this way out. The suggestion clearly is that there is a ‘third’ way – and a way that in some altered sense of the words involved might still be, perhaps misleadingly, expressed by the claim that the external world *is* the work of our organs. Again, the Machian interpretation provides just such an interpretation. The world of sensory elements is the only world there is; as Mach remarked those collections of sensory elements, *A B C ...*, that aren’t my body, *K L M ...*, may for some purposes be plausibly treated as ‘external’ to my body – this is, as he suggests, what we do in physics. But, of course, to quote Mach again:

Precisely viewed, however, it appears that the group *A B C ...* is *always* codetermined by *K L M*. A cube of wood when seen close at hand, looks large; when seen at a distance, small; it looks different with the right eye from what it does with the left; sometimes it appears double; with closed eyes it is invisible. The properties of the same body, therefore, appear modified by our own body; they appear conditioned by it. But where, now, is the *same* body, which to the appearance is so *different*? All that can be said is, that with different *K L M* different *A B C ...* are associated.⁵²

Thus, changes in our sense organs, understood as particular complexes of sensory elements, are connected to changes in the way things in the external world are, where talk of the external world is now understood as the complexes that do not form my body or my thoughts. Or, as he puts it more dramatically later:

All elements *A B C ...*, *K L M ...* constitute a *single* coherent mass only, in which, when any one element is disturbed, *all* is put in motion; except that a disturbance in *K L M ...* has a more extensive and profound action than in *A B C*. A magnet in our neighbourhood disturbs the particles of iron near it; a falling boulder shakes the earth; but the severing of a nerve sets in motion the *whole* system of elements.⁵³

To sum up in Mach’s words:

There is no rift between the psychical and the physical, no inside and outside, no ‘sensation’ to which an external ‘thing,’ different from sensation, corresponds. There is but one kind of elements, out of which this supposed inside and outside are formed – elements which are themselves inside or outside, according to the aspect in which, for the time being, they are viewed.⁵⁴

Conclusion

Let me conclude with a few comments about what I hope to have shown. I began by suggesting that, in attempting to save Nietzsche from being set up as the forerunner for various kinds of radical scepticisms, we are often heartened by his emphasis on the senses and science. This, and much else he says, can remind us of the work of a range of Nietzsche’s contemporaries and predecessors, many of whom were quite science-friendly. There were, as I said at the beginning, however, a bewildering range of views at that time and there was, and is, a bewildering range of labels which could reasonably be applied singly and jointly to many of these views: empiricism, materialism, positivism, naturalism, sensualism, not to mention all the neo-Kantian

schools and personalities. And again, let me emphasize, many of these views were, in their own, but crucially different, ways friendly to the senses and science. So placing Nietzsche must be done with care – both historical care and, given the ambiguity of many of the labels, semantic care.

I then turned to Nietzsche's own very famous history of metaphysics and epistemology – the history, of course, of an error. He positions himself after the 'cockcrow of positivism' at the end of this error in *Twilight of the Idols*. I suggested that it might make sense to look at his contemporaries who placed themselves, or can obviously be placed, in just this manner. I suggested the name of Ernst Mach. I did this for a couple of reasons: first, as I hope to have shown, because much of what Mach says is strikingly similar to what Nietzsche says, in particular in his attempt to get rid of the distinctions between appearance and reality and the internal and external world; second, a Machian reading of Nietzsche provides insight into what are otherwise opaque texts and doctrines; and, finally, because Mach's own views and career show us how one can take science and the senses quite seriously without straightforwardly accepting 'the common sense picture of the world of relatively enduring middle-sized objects or the scientific world-view'.⁵⁵ There is thus useful rhetorical force in using someone whose pro-science credentials are hard to criticize to interpret and articulate Nietzsche's similarly sceptical, though more strident, claims about physics, and our common-sense view of the world, as merely interpretations of the world – and interpretations that simplify and mislead and thus falsify.

Notes

- 1 I would like to thank Thomas Brobjer, Maudemarie Clark, Dagfinn Føllesdal, Kathleen Higgins, Christopher Janaway, Agnieszka Jaworska, Krista Lawlor, Brian Leiter, Greg Moore, John Perry, John Richardson, Tamar Schapiro, Larry Sklar, Robert C. Solomon, Susan Sterrett, Michael Strevens, and Allen Wood for useful discussions of the issues raised in this paper. Thanks to an audience at Yale University especially Karsten Harries and Pierre Keller. Thanks to Lanier Anderson for several very helpful conversations. Thanks to Iain Morrison for his comments on a presentation of some of this material at a Nietzsche conference at the University of Texas, Austin. Finally, I would like to thank David Hills for extremely useful comments on an ancestor of this paper and general discussions of related matters over a period of many years.
- 2 See, for example, Maudemarie Clark's and Brian Leiter's introduction to *Daybreak*, trans. R.J. Hollingdale (Cambridge: Cambridge University Press, 1997), pp. vii–xxxvii. Clark and Leiter emphasize the empiricist, materialist and naturalist influences on, and sympathies of, Nietzsche. See also Ken Gemes, 'Nietzsche's Critique of Truth', *Philosophy and Phenomenological Research*, 52 (1992), 47–65; Brian Leiter, 'Perspectivism in Nietzsche's *Genealogy of Morals*', in Richard Schacht (ed.), *Nietzsche, Genealogy, Morality: Essays on Nietzsche's 'Genealogy of Morals'* (Berkeley, CA: University of California Press, 1994), pp. 334–57; Robert Nola, 'Nietzsche's Theory of Truth and Belief', *Philosophy & Phenomenological Research*, 47 (1987), 525–62; Richard Schacht, *Nietzsche* (London: Routledge, 1983), pp. 52–117; Kenneth Westphal, 'Nietzsche's Sting and the Possibility of Good Philology', *International Studies in Philosophy*, 16 (1984), 71–90; idem, 'Was Nietzsche a Cognitivist?', *Journal of the History of Philosophy*, 22 (1984), 343–63; John T. Wilcox, *Truth and Value in*

- Nietzsche: A Study of His Metaethics and Epistemology* (Ann Arbor, MI: University of Michigan Press, 1974), pp. 155–70; and Maudemarie Clark, *Nietzsche on Truth and Philosophy* (Cambridge: Cambridge University Press, 1990).
- 3 For forceful statements of this reading of Nietzsche as a naturalist, see Clark and Leiter, 'Introduction', pp. vii–xxxvii; Brian Leiter, *Routledge Philosophy Guidebook to Nietzsche on Morality* (London: Routledge, 2002), pp. 1–72.
 - 4 Leiter, *Nietzsche on Morality*, pp. 15–25.
 - 5 Clark, *Nietzsche on Truth*. See also Clark's 'On Knowledge, Truth and Value: Nietzsche's Debt to Schopenhauer and the Development of Empiricism', in Christopher Janaway (ed.), *Willing and Nothingness: Schopenhauer as Nietzsche's Educator* (Oxford: Clarendon Press, 1998), pp. 37–78. I am not suggesting that the talk of interpretations in *BGE* 14 entails falsification, but the naturalist is normally construed as taking science to be successfully in the business of generating explanations.
 - 6 Auguste Comte, *Introduction to Positive Philosophy*, trans. Frederick Ferré (Indianapolis/New York: Bobbs-Merrill, 1970), p. 1. Nietzsche owned the German edition of this work: Auguste Comte, *Einleitung in die positive Philosophie* (Leipzig, 1880).
 - 7 Comte, *Positive Philosophy*, p. 2.
 - 8 *Ibid.*, p. 8.
 - 9 John Stuart Mill, *Auguste Comte and Positivism*, in vol. 10 of *Collected Works of John Stuart Mill* (Toronto: University of Toronto Press, 1969), pp. 265–66. This, too, is a source on Comte that Nietzsche may well have read. Nietzsche's library contained a marked-up copy of John Stuart Mill's collected works translated into German including 'August Comte und der Positivismus'. Lange also refers to this book in his discussions of Comte in *The History of Materialism*, trans. Ernest Chester Thomas, 2 edn (London: Trübner, 1879).
 - 10 *PTA* 5–8; *D* 83, 86, 119; *GS* 54, 57–59, 109; *GM* iii 16; *A* 13–14, 59; *BGE* 23, 134, 230; *TI* 'Errors' 6; 'Reason' 1–3, 6; *TI* 'World'; *EH* 'Clever' 2; *KSA* 13, 15[51], [90].
 - 11 Cf. Bernd Magnus, *Nietzsche's Existential Imperative* (Bloomington: Indiana University Press, 1978), pp. 132–36.
 - 12 Mach produced several later editions that included more material. The 1897 English translation of the first edition already includes material not present in the first German edition of 1886. This new material is then incorporated into, and further expanded, in later German editions. The second German edition did not appear till 1900 and is thus too late to influence Nietzsche. I have cited the English 1897 translation of the first edition. However, all texts cited are present in the first German edition of 1886 (Ernst Mach, *Beiträge zur Analyse der Empfindungen* (Jena: Fischer, 1886)).
 - 13 Ernst Mach, *Contributions to the Analysis of the Sensations*, trans. C.M. Williams (Chicago: Open Court, 1897), p. 23 n.1.
 - 14 *Ibid.*, pp. 10, 12. Manfred Sommer, *Husserl und der frühe Positivismus* (Frankfurt am Main: Klostermann, 1985), p. 18, uses the label *Empfindungsmonismus* for Mach's view. For a quick summary of Mach's view, see Walter Del-Negro, *Konvergenzen in der Gegenwartsphilosophie und die moderne Physik* (Berlin: Duncker & Humblot, 1970), pp. 11–12.
 - 15 Mach, *Contributions*, pp. 19, 3, 5–6, 6.
 - 16 *Ibid.*, p. 8.
 - 17 *Ibid.*, p. 11.
 - 18 *Ibid.*, p. 9 n.1.
 - 19 *Ibid.*, p. 9.
 - 20 *Ibid.*, p. 22. Presumably it is not just physicists who make this mistake.
 - 21 Ernst Mach, *Popular Scientific Lectures*, trans. Thomas J. McCormack, 3 edn (Chicago: Open Court, 1898), p. 192.

- 22 Mach, *Contributions*, p. 22. See also Georg Christoph Lichtenberg, *Schriften und Briefe* (Munich: Hanser, 1967–72), vol. 2, p. 412.
- 23 Mach, *Contributions*, p. 152.
- 24 Rudolf Eisler, *Nietzsches Erkenntnistheorie und Metaphysik: Darstellung und Kritik* (Leipzig: Hermann Haacke, 1902), pp. iii, 26, 35, 57, 60, 62, 65–66, 71.
- 25 *Ibid.*, p. iii. In this foreword he also emphasizes the similarities between Nietzsche's views and the "Voluntarism" of modern philosophers like Wundt'.
- 26 Hans Vaihinger, *Die Philosophie des 'Als ob': System der theoretischen, praktischen und religiösen Fiktionen der Menschheit auf Grund eines idealistischen Positivismus*, 5th and 6th edn (Leipzig: Meiner, 1920).
- 27 *Ibid.*, pp. xiii–xv. This introduction does not seem to be present in the English translations.
- 28 Cf. Walter Del-Negro, *Die Rolle der Fiktionen in der Erkenntnistheorie Friedrich Nietzsches* (Munich: Rösl, 1923), pp. 192–97.
- 29 Hans Kleinpeter, *Der Phänomenalismus, eine naturwissenschaftliche Weltanschauung* (Leipzig: Barth, 1913) and, for example, idem, 'Ernst Mach und Friedrich Nietzsche', *Neue Freie Presse*, 23 February 1913. Kleinpeter's letters to Mach are cited in: K.D. Heller, *Ernst Mach: Wegbereiter der modernen Physik* (Vienna and New York: Springer, 1964). Unfortunately, Mach's letters to Kleinpeter are lost; see John T. Blackmore, R. Itagaki, and S. Tanaka (eds), *Ernst Mach's Vienna, 1895-1930, or, Phenomenalism as Philosophy of Science* (Dordrecht/Boston: Kluwer, 2001), p. 232 n.39.
- 30 Quoted in John T. Blackmore, *Ernst Mach: His Work, Life, and Influence* (Berkeley, CA: University of California Press, 1972), p. 123.
- 31 Kleinpeter, *Der Phänomenalismus*, p. 143 n.1.
- 32 Philipp Frank, *Between Physics and Philosophy* (Cambridge, MA: Harvard University Press, 1941), pp. 51–54. He cites KSA 12, 8[2], 9[40], KSA 13, 14[103].
- 33 Blackmore, *Ernst Mach*, p. 123.
- 34 *Ibid.*
- 35 Ernst Mach, *The Analysis of Sensations* (New York: Dover, 1959), p. 25.
- 36 Heller, *Ernst Mach*, p. 69 n. 1.
- 37 Blackmore, Itagaki and Tanaka, *Mach's Vienna*, p. 232 n.39.
- 38 Heller, *Ernst Mach*, p. 70.
- 39 Mach, *Contributions*, p. 23 n.1.
- 40 Mach, 'Economical Nature of Physical Inquiry', in *Popular Scientific Lectures*, p. 210 n. The collection referred to is his *Popular Scientific Lectures*.
- 41 Mach, *Contributions*, p. 23 n.1.
- 42 As further evidence for my reading, I point to BGE 16, where Nietzsche attacks the idea of 'immediate certainties' – an attack on the notion of privileged access to some inner realm.
- 43 Lange, *Materialism*, vol. 3, p. 202. Lange thus also fails to follow Nietzsche and Mach to stages five and six outlined in *TI* 'World'.
- 44 *Ibid.*, pp. 205–19.
- 45 *Ibid.*, pp. 215, 23.
- 46 *Ibid.*, p. 219. See also pp. 223–24.
- 47 *Ibid.*, p. 230.
- 48 Indeed, it is this argument from Lange that Nietzsche approvingly quotes in a letter to his friend Carl von Gersdorff at the end of August 1866 (*KSB* 2, pp. 159–60) reporting his recent discovery of Lange's *History of Materialism* and recommending the book. In the letter Nietzsche quotes, of course, from the 1866 first edition in which the first sentence of the third step reads differently: 'Our real organization remains therefore just as unknown to us as the real external objects' (Lange, *Geschichte des Materialismus und Kritik seiner Bedeutung in der Gegenwart*, 1st edn (Iserlohn: Baedeker, 1866), p. 493).

I do not think this affects the basic point of the argument in the text. Nietzsche does take Lange's talk of 'real' organization and things to be equivalent to talk of transcendental things-in-themselves; after quoting this section from Lange in his letter, he continues to summarize Lange's point as follows: 'Thus the true essence of things, the thing in itself, is not only unknown to us, but also the very notion of it is nothing more nor less than the final product of a contrast dependent on our organization.'

- 49 Cf. the use of 'regulative Hypothese' in KSA 11, 34[247]. See also GS 344, KSA 11, 26[263] and the discussion, and references, in Hans Vaihinger, *The Philosophy of 'As if'*, tr. C.K. Ogden (London: Routledge & Kegan Paul, 1935), p. 353 n.2.
- 50 Whether Lange is really right about this is a good question. Surely Nietzsche's point raises a puzzle for Lange. Would a materialist story understood purely in terms of the phenomenal world avoid the contradiction Nietzsche is pointing to? This depends in part on whether or not Lange's translation retains some version of the causally epiphenomenal inner world or not.
- 51 Lange, *Materialism*, vol. 3, pp. 208–17; Mach, *Analysis of Sensations*, p. 39.
- 52 Mach, *Analysis of Sensations*, p. 9.
- 53 *Ibid.*, p. 14.
- 54 *Ibid.*, p. 310.
- 55 Clark, *Nietzsche on Truth*, p. 108.