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NATURALISM

Geert Keil

Introduction

"We are all naturalists now," declared Roy Wood Sellars (1880–1973) in 1922.[1] A bold assertion then, it had come closer to the truth by the end of the century. During the course of the twentieth century, "naturalism" seems to have become a synonym for a respectable philosophical methodology. On the other hand, there are a number of distinguished philosophers who advise against paying too much attention to what they view as a long series of unsuccessful naturalistic endeavors. As Peter Geach (1916–) has written:

> When we hear of some new attempt to explain reasoning or language or choice naturalistically, we ought to react as if we were told someone had squared the circle or proved $\sqrt{2}$ to be rational: only the mildest curiosity is in order – how well has the fallacy been concealed?[2]

This clash of opinions is remarkable. For Geach, it goes without saying that the series of naturalistic approaches is a series of failures, whereas Sellars takes it for granted that we are all naturalists now.

It appears that the parties are not talking about the same thing. Sellars described naturalism as "less a philosophical system than a recognition of the impressive implications of the physical and biological sciences."[3] This characterization is typical for naturalists from the first half of the century. John Dewey (1859–1952) described a naturalist as "one who has respect for the conclusions of natural science."[4] If this kind of respect suffices to be converted to naturalism, then one can easily accept Sellars's view. It seems silly to deny or belittle the unprecedented success of the natural sciences since the Enlightenment. Or, in the words of Bouwsma, "Who then would not accept scientific method, and prefer to go to Babylon by candlelight? Scientific method is successful."[5] If the only alternatives to naturalism are obscurantism, superstition, and supernaturalism, then naturalism seems to be the only game in town in our scientific culture. Although there still exist enclaves of religiously motivated supernaturalism, particularly in the United States, naturalism has become the most forceful metaphilosophical trend of the twentieth century.

When Geach takes any "new attempt to explain reasoning or language or choice naturalistically" to be doomed to failure, he has more specific and demanding tasks in mind. Sellars and Dewey give general vindications for the natural sciences, whereas Geach refers to specific projects of naturalization. Now, having respect for the natural sciences and their methods does not yet guarantee the success of specific naturalistic projects. When it comes to these projects, naturalism does not compete with obscurantism and supernaturalism, but rather with well-established philosophical theories that purport to explain phenomena with the use of non-empirical methods. Some naturalists hold that non-empirical methods are unscientific. But if this were true, then, not only philosophy but also neither mathematics nor logic could contribute to our scientific picture of the world.

The attractiveness of philosophical naturalism crucially hinges on the available alternatives. As long as naturalists confine themselves to selling their position as a bulwark against irrationality, obscurantism, and superstition, they insinuate that any kind of philosophy not committed to naturalism must be obscurantist.[6]

So let us take a step back. The *Oxford English Dictionary* defines a naturalist as "one who studies natural, in contrast to spiritual, things," or as "one who studies, or is versed in, natural science."[7] This non-philosophical meaning can be traced back to the medieval Latin expression *naturalista*. Secondly, a naturalist is someone who believes in philosophical naturalism, which is characterized by the *OED* as "a view of the world, and of man's relation to it, in which only the operation of natural (as opposed to supernatural or spiritual) laws and forces is admitted or assumed." Finally, in literary theory and the history of art, "naturalism" is a term for a certain style or epoch. Zola was a naturalist in the third sense of the word, Quine in the second, and Darwin in the first. Only naturalism in the second sense is a philosophical position. It is this second sense that this chapter addresses.

Naturalism in the first half of the century

As a philosophical trend, naturalism has played a prominent role since the late nineteenth century. Of course, the term is older. Christian apologetics from the seventeenth century used it in a pejorative sense. Naturalists were labeled with the epithets "blasphemous" and "atheistic," where a naturalist was simply someone who refused Christian supernaturalism. As quoted above from the *OED*, naturalists aimed to explain all phenomena with "the operation of natural (as opposed to supernatural or spiritual) laws and forces." Philosophical naturalism in the present sense of the word has been characterized thus: "The closest thing to a common core of meaning is probably the view that the methods of natural science provide the only avenue to truth."[8] Understood in this sense, the term has been in use on a larger scale since the late nineteenth century. Unquestionably, Hobbes and Hume would today call themselves "naturalists," and so would Holbach and LaMettrie. We have to keep in mind, however, that the geography of those debates was described in different terms. Throughout the nineteenth century, other -isms covered what is subsumed under "naturalism" today: materialism, mechanism, positivism, empiricism, and monism.

For clarity's sake, naturalism should not have the same meaning as one of the related expressions. It should also be distinguished from physicalism, biologism, psychologism, and behaviorism. This task is complicated by the fact that many declared naturalists – Quine being a classic example – also hold some of the other positions.

In programmatic declarations of naturalists, demarcations from nineteenth-century predecessor positions are the order of the day. Many naturalists are reluctant to adhere to materialism and mechanism – physics has changed after all. Ernest Nagel (1901–85) states representatively:

> Naturalism does not maintain that only what is material exists … What naturalism does assert as a truth about nature is that though *forms* of behavior or *functions* of material systems are indefeasibly parts of nature, forms and functions are not themselves agents in their own realization or in the realization of anything else.[9]

Within mid-century American naturalism, the question whether naturalism entails materialism was discussed at length.[10] The phrasing "the methods of natural science provide the only avenue to truth" has the advantage that it does not commit naturalism to a specific leading science. Contrary to physicalists, biologists, and behaviorists, a naturalist has a right to relate to all sciences. However, the claim by Dewey, Hook, and Nagel that scientific naturalism is ontologically neutral was called into question, for they counted only spatio-temporally extended bodies with causal powers as scientifically researchable entities. Hence: "Their naturalism is just materialism over again under a softer name."[11]

The two eminent figures of early American naturalism were John Dewey and George Santayana (1863–1952). They will not be discussed here in detail, because their views were interwoven with other ideas in such a way that they contain no distinctive naturalistic program. In *Scepticism and Animal Faith*, Santayana proposed a biologically inspired, anti-rationalist, pragmatist epistemology, according to which knowledge consists of inescapable belief essential for action ("animal faith mediated by symbols"). Correspondingly, Dewey's naturalism cannot be easily told apart from his pragmatism. (For the connection between American naturalism and pragmatism, see "American philosophy in the twentieth century," Chapter 5.) A recurrent theme in Dewey's thinking was a refutation of all kinds of dualisms. He wished to bridge the gaps between morals and science, between mind and body, man and nature, knowledge and the world. Besides, Dewey refused the idea of perception as passive observation and operated with an extended concept of *experience* instead. He also favored a pragmatic notion of truth and advocated fallibilism. In the 1920s, Santayana and Dewey conducted what seems today a scarcely comprehensible debate about the "right" naturalism.[12] Santayana accused Dewey of being only a "half-hearted naturalist," and Dewey retorted that Santayana's naturalism "reduces itself to a vague gesture of adoring faith in some all-comprehensive unknowable," while he himself has "tried to bring together on a naturalistic basis the mind and matter that Santayana keeps worlds apart."[13]

In the first half of the century, American naturalism, as advocated by Dewey, Santayana, Woodbridge, Roy Sellars, and Sidney Hook (1902–89), was not a particularly well-defined view. Some decades later Sellars's son, himself an eminent philosopher, remembers:

> As for Naturalism. That, too, had negative overtones at home. It was as wishy-washy and ambiguous as Pragmatism. One could believe *almost* everything about the world and even *some* things about God, and yet be a Naturalist. What was needed was a new, nonreductive materialism.[14]

Only when Quine bound naturalism to the definite superiority of scientific method did a distinct program emerge, more specific than the broad-churched naturalisms from the first half of the century.

In German-speaking countries, the situation toward the end of the nineteenth century was marked by the methodological emancipation of the *Geisteswissenschaften* (humanities).[15] In the work of Ranke, Droysen, Jacob Burckhardt, and Wilhelm Dilthey (1833–1911), naturalism was opposed to *historicism*. Historicism included the claim that scientific method necessarily fails to capture the historical and thus the specific human aspects of civilization. By proposing a "Critique of Historical Reason," Dilthey tried to rid the historic sciences of their metaphysical presuppositions about the subjects of history and nature. He thus turned a metaphysical dispute into a methodological debate about the relation between natural sciences and humanities. This was later called the *explanation/understanding* (*Erklären/Verstehen*) controversy.[16] Dilthey put it bluntly: "We explain nature, but we understand mental life."[17] In this debate, naturalists demanded a unified scientific methodology, i.e. a methodological monism.[18] The "historical," and later "culturalist" or "hermeneutic" counterparty proposed a dualistic, or at least a complementary relationship between the natural sciences and the humanities. In the explanation/understanding controversy, adherents of the humanities party at first defended a historicist position, since the humanities viewed themselves as an essentially historical discipline, particularly in Germany. This turned out to be insufficient, because philology and systematic linguistics did not fit into the picture. The new catchword in defending the independence of the humanities was "culture." The proponents of Southwest German neo-Kantianism (Windelband, Rickert), in particular, laid out a methodological foundation of cultural sciences, which was taken to be independent of ontological premises.

The term "culturalism," though, is not yet in general use; the major dictionaries show no respective entry. In western universities, however, "cultural studies" are flourishing. It is not easy to see how the constituent fields of study are bound together methodologically. At any rate, they are *not* naturalistic, given their methodological pluralism. Those who emphasize the culturally and historically shaped character of human existence typically refuse to accept scientific method as the only avenue to truth.

Three eminent figures

Among the three most influential twentieth-century philosophers, two were moderate anti-naturalists; the third was a convinced naturalist.

Edmund Husserl (1859–1938)

In his earlier works Husserl dealt with naturalism in the form of psychologism. Psychologism was prefigured in British empiricism and widespread in the late nineteenth century. It equated the laws of logic with the psychological laws of thought. Frege, Husserl, and the neo-Kantian Paul Natorp (1854–1924) were all eminent critics of psychologism. Husserl's objections to psychologism were not original; indeed, the essential arguments from volume one of his *Logical Investigations* (1900) can already be found in Frege. Frege summarized his views as follows: "an explanation of a mental process that ends in taking something to be true, can never take the place of proving what is taken to be true."[19] Anti-psychologism insists that questions of validity are independent from questions of the actual acquisition of knowledge; the *quaestio facti* can never replace the *quaestio iuris*. Husserl followed this idea. The ongoing debates about naturalizing epistemology are partly a resumption of the psychologism controversy.

The most important source for Husserl's critique of naturalism, however, is his later essay *Philosophy as a Rigorous Science* (1911). In this work, Husserl argues against a "naturalization of reason," which he criticizes as "countersense."[20] He points out in particular that experimental psychology, as a science of facts, can never account for the *justification* of rational claims.[21] The natural scientist advances arguments and adduces evidence, but he cannot explain, according to Husserl, the normative force of the laws of logic he presupposes. Empirical science fails to face the phenomenon of *normativity*, as it is later termed.

Husserl adds that the empirical sciences are essentially naive. They take their objects of research as given, and hence they cannot develop a critical stance towards their own presuppositions and assumptions.[22] For Husserl, to expect natural science to provide the solution for a genuine epistemological problem "would mean to move in a countersensical circle."[23] Natural science is bound to miss the epistemological problem, for it cannot answer the *quaestio iuris*.[24]

Husserl characterizes naturalism by its totalization of the experimental method.[25] He complains that nowhere in experimental psychology has the necessary methodological work of acquiring rigorous concepts been carried out: "We look for it in vain in the vast literature" of "'exact' psychology."[26] Within empirical psychology, this shortcoming cannot be remedied, for the attempt "to obtain the rigorous concepts that alone can give scientific value to the characterization of the psychical [. . .] by psychophysical experiments [. . .] would be the pinnacle of absurdity."[27] Two decades later, Wittgenstein snidely noted in a similar fashion: "For in psychology, there are experimental methods *and conceptual confusion*."[28]

Arguably, pivotal to Husserl's critique of naturalism is his objection that it is viciously circular. Experimental philosophy takes for granted the possibility of knowledge and

experience, but it never isolates phenomenal experience. It "unavoidably carries out analyses of the contents of these [psychological] concepts" which are "a priori," while it does not recognize that "presuppositions of experimental methods cannot be justified through themselves."[29] It is this alleged circularity of a naturalized epistemology that Quine later countered with the following move: "such scruples against circularity have little point once we have stopped dreaming of deducing science from observations."[30]

Finally, it is characteristic of Husserl's critique of naturalism in *Philosophy as a Rigorous Science* that he criticizes the presumptuousness of an empirical science that does not know its own boundaries in the name of a *better* and *more profound* science. Far from being opposed to the scientific pursuit of truth, phenomenological philosophy claims to be a more rigorous science that reflects and compensates for the shortcomings of empirical psychology. Husserl has also envisaged the cultural reverberations of scientific naturalism. He is especially annoyed at "that kind of sham philosophical literature … that grows so rampantly today and that offers us, with the pretension to the most serious scientific character," to renew all philosophical theories "on a natural scientific and above all 'experimental-psychological basis'." In view of that literature, Husserl adds, "one can only be astonished at the decline of the sense for the profound problems and difficulties to which the greatest minds of mankind have devoted their life's work."[31]

Ludwig Wittgenstein (1889–1951)

The most important characteristic of Wittgenstein's critique of naturalism is his strict demarcation between philosophy and the natural sciences. Wittgenstein drew this line in the *Tractatus*: "Philosophy is not one of the natural sciences" (4.111). The task of natural science is to determine "the totality of true propositions" (4.11), whereas philosophy aims at "the logical clarification of thoughts." Hence, the result of the philosophical enterprise is "not a number of 'philosophical propositions', but to make propositions clear" (4.112).

In Wittgenstein's demarcation between philosophy and the natural sciences, the former pays a high price. Philosophy is deprived of participating in the pursuit of truth. This consequence is due to the peculiar theory of meaning in the *Tractatus*, according to which philosophical sentences, including the sentences of the *Tractatus* itself, lack truth values. According to Wittgenstein, there are no logical and philosophical truths, for only those sentences have sense that are a picture of reality (4.021). If one does not share Wittgenstein's curious theory of meaning, it is hard to see why the logical clarification of thoughts to which Wittgenstein restricts philosophy should not contribute to the pursuit of truth, namely by yielding *conceptual* truths.

Wittgenstein held on to the methodological confrontation between philosophy and the natural sciences, even when his picture of philosophical practice had changed in his later work. In his middle period, Wittgenstein used to say things such as:

> Philosophers constantly see the method of science before their eyes, and are irresistibly tempted to ask and answer questions in the way science does. This

> tendency is the real source of metaphysics, and leads the philosopher into complete darkness.[32]

In this respect, Wittgenstein was the natural antipode to Quine, who assumed a continuum between philosophy and the other sciences. While Wittgenstein was tremendously interested in determining what is *distinctive* about philosophical investigations, for Quine, this concern was a matter of indifference. The Oxford philosopher Peter Hacker (1939–) put the disagreement bluntly: "If Quine is right, then philosophy is an extension of science … If Wittgenstein is right, then philosophy is *sui generis*."[33]

An important element of Wittgenstein's skepticism towards naturalization projects was the conceptual conservativism inherent in his ordinary-language approach. The following, much-debated remark is typical: "Only of a human being and what resembles (behaves like) a living human being can one say: it has sensations; it sees, is blind; hears, is deaf; is conscious or unconscious."[34] A few decades later, cognitive scientists and philosophers of mind began to attribute mental states to computers, to robots and to brains, and some even to thermostats. Wittgensteinians take the quoted remark as a significant insight, which anticipates the objection to the widespread *homunculus fallacy* in the cognitive sciences, namely "the reckless application of human-being predicates to insufficiently human-like objects," which is "tantamount to the postulation of a little man within a man to explain human experience and behaviour."[35] Cognitive scientists have countered Wittgenstein's verdict by claiming that answering the question whether computational or neural processes can be described with mental predicates goes astray, if the answer is simply stipulated with reference to ordinary usage of language. The *functionalist* view of the mental assumes that mental states are abstract and multiply realizable. From this viewpoint, it appears to be dogmatic to assert that living human beings are the only bearers of mental predicates.[36]

As quoted above, Wittgenstein occasionally criticized conceptual confusions within experimental psychology. However, he never developed a thorough methodological and conceptual criticism of theories in the empirical sciences of mind and language. His main focus was always on unmasking bad philosophy, rather than on unmasking bad science.

I have called Wittgenstein a *moderate* anti-naturalist, for while he emphasized the autonomy of philosophy with respect to the natural sciences, he took the subjects of his philosophical endeavor – language and mind – as situated in the natural and social world. Some of his doctrines have been interpreted in the spirit of a non-reductive naturalism (among others, by Peter Strawson), particularly, his idea of the connection between language-games and forms of life, his behavioristic references to "trained" or "inculcated" rule-following, and his occasional appeals to the "natural history" of our species.[37] Arguably, this assessment is based on an equivocation in the notion of nature. The late Wittgenstein repeatedly points out that changing certain beliefs and language-games is not on offer to us. The only notion of nature, however, that could support these remarks is the *topos* of the nature of things. But the reference to an unalterable human nature does not by itself render a position a naturalistic one (see

the section "Naturalism and human nature," below). For Wittgenstein, the reason why we cannot change at will our language-games and forms of life is not grounded in our physical or biological nature, but rather in the quasi-transcendental condition that the game of doubting presupposes a frame, or background, of unquestioned certainty.[38] Wittgenstein does not entertain the idea of naturalizing this background; at most he suggests its socialization. The relevant kind of stability and inertia is explicable by social, or cultural, reasons. This is why Strawson suggests the label "social naturalism" for Wittgenstein's later views.[39]

Willard Van Orman Quine (1908–2000)

If there was a prototypical naturalist of the twentieth century, it was W. V. O. Quine. For Quine, naturalism plays a twofold role. On the one hand, he is the inventor of the label "naturalized epistemology" (see below). On the other, the term "naturalism" gives a general characterization of Quine's philosophy. Quine's epistemological and meta-philosophical naturalism have a common root that comes out in the following:

> I hold that knowledge, mind, and meaning are part of the same world that they have to do with, and that they are to be studied in the same empirical spirit that animates natural science. There is no place for a prior philosophy.[40]

Quine's meta-philosophical naturalism consists in the "abandonment of the goal of a first philosophy prior to natural science."[41] The natural sciences require no philosophical foundation. They are "not answerable to any supra-scientific tribunal."[42] They need not justify themselves at the "court of reason," as Kant demanded. Formulated positively, Quine's meta-philosophical naturalism comprises his *thesis of continuity* between philosophy and science: "I see philosophy not as an *a priori* propaedeutic or groundwork for science, but as continuous with science."[43]

The continuity thesis is only understandable in the light of Quine's unusually broad notion of "science." Unlike Wittgenstein, who equates "science" with "the sum total of the natural sciences," Quine finds it "awkward that 'science', unlike *scientia* and *Wissenschaft*, so strongly connotes natural science nowadays."[44] Quine's notion of "total science" encompasses "the totality of our so-called knowledge or beliefs" which constitutes "a man-made fabric which impinges on experience only along the edges."[45] In Quine's view, all sciences interlock to some extent, and his main reason for this view is that all sciences "share a common logic and generally some common part of mathematics, even when nothing else."[46]

Quine's sweeping notion of science includes a second continuity thesis, namely, the view that "science is a continuation of common sense."[47] Both the scientist and the common man are engaged in the pursuit of truth, and we may safely reckon that the majority of truths ever discovered was not discovered by professional scientists. Commonsense investigations have a scientific or proto-scientific character insofar as both the scientist and the common man care about empirical evidence:

> The scientist is indistinguishable from the common man in his sense of evidence, except that the scientist is more careful. This increased care is not a revision of evidential standards, but only the more patient and systematic collection and use of what anyone would deem to be evidence.[48]

While Quine's views about the continuity between philosophy and natural science are characteristic of his naturalism, his view that science is a continuation of common sense is very much in the spirit of American *pragmatism*.

An important building block of Quine's critique of a priori philosophy is his famous attack on the analytic/synthetic distinction (see "Kant in the twentieth century," Chapter 4).[49] Logical empiricism defined analytical sentences as those that are true by virtue of the meanings of their constituent words, while synthetic sentences are true depending on how the world is. In "Two dogmas of empiricism," Quine argues that no clear line can be drawn between analytic and synthetic sentences, more precisely: all attempts to define analyticity are circular. The expressions *analytical*, *synonymous*, *necessarily true*, *true by definition*, and *true in virtue of a semantical rule* form a definitional circle that cannot be broken by means of a scientifically respectable extensional language. Quine concludes: "That there is such a distinction to be drawn at all [between analytic and synthetic statements] is an unempirical dogma of empiricists, a metaphysical article of faith."[50] The connection with naturalism arises from the fact that for Quine one effect of abandoning this dogma is "a blurring of the supposed boundary between speculative metaphysics and natural science."[51]

Let us return to Quine's definition of naturalism as the "abandonment of the goal of a first philosophy prior to natural science," and as "the recognition that it is within science itself, and not in some prior philosophy, that reality is to be identified and described."[52] Late in his career, Quine acknowledged "these characterizations convey the right mood, but they would fare poorly in a debate. How much qualifies as 'science itself' and not 'some prior philosophy'? [...] What then *have* I banned under the name of prior philosophy?"[53] These are good questions to ask. Quine seems eventually to have had an inkling of how vaguely he had always described his naturalism. Unfortunately, he refrained from answering these questions, reiterating instead "demarcation is not my purpose."[54] This declaration will not do, since the very intelligibility of his naturalism hinges on such a demarcation. The question of how much qualifies as "science itself" and not "some prior philosophy" will have to be addressed.

The nature of naturalism

Naturalism was too multifarious a philosophical trend in the twentieth century to confine oneself to three eminent figures. So let us complement this with a second approach. Some expressions are *motivated*, as linguists say; that is, they contain morphemes that hint at the meaning of the whole. "Naturalism" contains the morpheme "nature." So, one should be able to tell how this came about.

The concept of nature is an iridescent concept in philosophy. Hume and Mill already regarded it as "vague" and "indeterminate," the chemist and natural philos-

opher Robert Boyle (1627–91) even suggested banning it from philosophical usage. It is helpful to situate ambiguous terms in the logical space of their counter-concepts, which is the way the concept of nature has always had its contours established. The classical dichotomies are: *physis* versus *nomos*, *physis* versus *technē*, and *physis* versus *thesis* in Greek philosophy; nature versus the supernatural in the Judeo-Christian tradition, nature versus freedom in Kant, nature versus mind, nature versus culture, and nature versus society in the modern age. In the self-characterization of naturalistic positions in the second half of the century, these antitheses play a gradually diminishing role. Although "naturalism" contains the morpheme "nature," only a few naturalists explain their position by means of the concept of nature. Now it seems only fair to demand that someone who refuses to speak about nature should be silent about naturalism. However, the connection could be weaker than the word "naturalism" suggests. Being defined by the superiority of scientific method, naturalism refers to *natural science* rather than to *nature*.

Under modernity, nature has lost many of its former attributes, with the effect that the concept of nature has gradually became paler. In the triumphant advance of modern natural sciences, animistic and teleological views about nature have receded, as well as the conception of a divine natural order in which everything has its predestined place. For Kant, "nature" was nothing more than the epitome of appearances falling under strict laws. In the same way, for naturalists today, nature is essentially anything that is the subject of natural sciences and in the realm of the laws of nature. In this sense, the concept of natural sciences appears to be more basic than that of nature itself.[55] Besides, naturalists have little to say about the *extension* of the concept of nature. The realm of nature is taken to be identical with the realm of all being. Nature is simply what there is: "Naturalism … can be defined negatively as the refusal to take 'nature' or 'the natural' as a term of distinction. … For present-day naturalists 'Nature' serves rather as the all-inclusive category."[56] In other words, everything counts as nature, except for supernatural phenomena, and these do not exist anyway.

The demise of the qualitative concept of nature cannot be blamed on any single philosophical school or tradition. However, even if it should be possible to explain the concept of naturalism without the concept of nature, a successor problem emerges: a naturalism worth its name should be able to say something about what distinguishes the natural sciences from the other sciences. This shift of investigation marks a transition from *metaphysical* to *methodological* naturalism.

A classification of naturalisms

According to Ernest Nagel, "the number of distinguishable doctrines for which the word 'naturalism' has been a counter in the history of philosophy is notorious."[57] Neil Roughley adds: "The term can be used to designate anything from a broad commitment to keep the 'supernatural' out of philosophy to a methodologically highly specific conception of how that has to be done."[58]

It has become customary to distinguish different kinds of naturalism. Nevertheless, this custom has its dangers. The cheerful pluralism of attribute-naturalisms, as can

be found in recent literature on naturalizing epistemology,[59] does not absolve one from saying what all these positions have in common *qua* naturalisms. The following depiction is led by the idea that many explications of the concept of naturalism only seemingly compete; in fact, they represent *different levels of elaboration of the same basic idea*. I will distinguish three levels of elaboration: metaphysical, methodological, and semantic naturalism. This tripartite classification is not novel. It should be added that especially in the field of methodological naturalism, finer grained differentiations have been suggested.

Metaphysical naturalism

Naturalism as an ontological or metaphysical position is a thesis about what there is, or, how the world is structured. Metaphysical naturalism can be described by the sayings "Nature includes everything," "everything is natural," or "Everything is part of the natural world." These phrases leave open many questions, in particular what exactly is meant by "nature" or the "natural world." If nature is simply equated with everything that exists,[60] then such an universalization jeopardizes the requirement for naturalism to be a definable position. Some naturalists have noticed the danger of trivializing the concept of nature by universalization.[61] Metaphysical naturalism has to give criteria apt to *dis*qualify entities as parts of nature, *omnis determinatio* being *negatio* (every determination is a negation). However, the fuzzy concept of nature employed in metaphysical naturalism is not an accident. As described above, the modern concept of nature looks back over a long history of loss of semantic value. Yet before equating "nature" with "reality" or with "the existing," one should keep in mind that this loss of semantic value was closely tied to the development of a scientific worldview. Metaphysical naturalism was modeled on physical science as the last arbiter of questions about the structure of the world. The Australian materialist David Armstrong (1926–) defines "naturalism" as follows:

> Naturalism I define as the view that nothing else exists except the single, spatio-temporal world, the world studied by physics, chemistry, cosmology, and so on.[62]

> Naturalism … is the contention that the world, the totality of entities, is nothing more than the spacetime system.[63]

Here "Nature" is equated with "the spatio-temporal world," and naturalism is the view that nothing exists outside the spatio-temporal world. Interpreted in this fashion, the slogan "Everything is natural" amounts to a defense of ontological physicalism. However, Armstrong draws a more subtle distinction and regards physicalism as the additional thesis "that the only particulars that the spacetime system contains are physical entities governed by nothing more than the laws of physics."[64] I shall return to physicalism below.

Ontological or metaphysical naturalism may as well be formulated in terms of *facts* instead of objects. The American philosopher Gilbert Harman (1938–), for example,

claims: "Naturalism as a general view is the sensible thesis that *all* facts are facts of nature."[65] Yet other naturalists propose that all *properties* are natural properties. This variant can be found especially in the debate following G. E. Moore's objection to ethical naturalism, namely that "good" is not a natural property. (For further discussion of Moore, see "Twentieth-century moral philosophy," Chapter 20.)

Methodological, or scientific, naturalism

Many declared naturalists are reluctant to restrict metaphysical naturalism to a physicalistic position. They rather attempt to specify the indistinct dictum "everything is natural" methodologically. The metaphysical thesis that all things, facts, or properties are natural is turned into a methodologically grounded thesis about the privileged status of scientific knowledge, namely the thesis of the explanatory superiority of scientific method. A few examples: Sidney Hook writes:

> Despite the variety of specific doctrines which naturalists have professed from Democritus to Dewey, what unites them all is the wholehearted acceptance of scientific method as the only reliable way of reaching truths about the world of nature, society, and man.[66]

And Arthur Danto:

> Naturalism … is a species of philosophical monism according to which whatever exists or happens is natural in the sense of being susceptible to explanation through methods which, although paradigmatically exemplified in the natural sciences, are continuous from domain to domain of objects and events.[67]

David Armstrong:

> [I]t is natural science that gives us whatever detailed knowledge we have of the world.[68]

Manley Thompson:

> The closest thing to a common core of meaning is probably the view that the methods of natural science provide the only avenue to truth.[69]

W. V. O. Quine:

> We naturalists say that science is the highest path to truth.[70]

The quoted passages clearly exceed general demonstrations of respect for the natural sciences (remember Dewey's definition of a naturalist as "one who has respect for

the conclusions of natural science"). For one thing, the natural sciences are distinguished by their *methods*: solely in following scientific methods are the sciences "the only avenue" or "the highest path" to truth. Secondly, a twofold *universalization* is bred: scientific method yields knowledge about everything that can be known, and it is the only reliable way to this knowledge. These universal claims are not optional ingredients of naturalism, rather they are part of the program's inner logic. One can surely admit that *areas* exist in which scientific method is unrivalled without being a naturalist. It lies in the logic of naturalism to tolerate no enclaves. This kind of naturalism is well put by Sellars:

> In the dimension of describing and explaining the world, science is the measure of all things, of what is that it is, and of what is not that it is not.[71]

I will call this the *scientia mensura* principle. A similar version can be found in Quine: "The world is as natural science says it is."[72] I shall use the three expressions "methodological naturalism," "scientific naturalism," and "*scientia mensura* naturalism" interchangeably to describe this view.

Another expression for this position is *scientism*. Because of its pejorative ring, however, hardly any naturalist uses this expression for self-characterization. Besides, often scientism is regarded less a theoretical, but rather a practical view about the *role* of science in society. All problem-solving shall be done by scientific methods, which answer to no higher authority. According to this kind of scientism, science is the only avenue not only to truth, but also to the solution of social and political problems. To avoid this connotation, I will not use the term "scientism."

The naturalist's talk of the only avenue to truth involves an emphasis that could lead to confusion. Hence two clarifications: first, "truth" simply stands for "the set of all true propositions." Second, part of the program's inner logic is universality, but not *infallibilism*. Superiority of scientific method does not imply that it inevitably leads to true propositions. Occasionally this latter claim was employed as defining attribute of naturalism,[73] yet on closer examination it is hard see why the *scientia mensura* principle should incorporate certainty or infallibilism.[74] The naturalist who rejected this inclusion most decidedly was Quine. According to him, scientific methods lead to assertions that are claimed to be true, yet always revisable. Even what is held to be true on the best scientific grounds, can in turn be proved wrong by science. For this reason, Quine adds to his credo that "the world is as natural science says it is" the proviso "insofar as natural science is right."[75] For him, it is part of the concept of science that it cannot guarantee truth. Skeptical doubts are part of science and they are answerable within science. Skepticism against science as a whole, however, is ill placed. In any period of scientific development, arguably there are more things in heaven and earth than are dreamt of in our philosophy. By way of compensation, as Lichtenberg has retorted to Prince Hamlet, there are many things in our science books which can be found neither in heaven nor on earth. But science books can be corrected. This is a permanent occupation of the sciences. A naturalist in the spirit of Quine takes science to be a self-correcting process of a methodo-

logically controlled pursuit for truth, "fallible and corrigible but not answerable to any supra-scientific tribunal."[76]

The above quoted definitions make it clear that scientific naturalism is not a scientific theory (arguably not even a family of theories), but rather a meta-philosophical thesis, or, in practice, a *program*. A program cannot be evaluated in the same way as a fully-fledged scientific theory, for it does not claim to have explained anything. The naturalistic program rather makes a claim about *explainability*. Now, since this claim itself needs to have a definable content, naturalism should not escape assessment owing to its vagueness. I said above that for scientific naturalism, the concept of the natural sciences is more basic than the concept of nature. On closer inspection, this view appears to be implausible. "Naturalism" contains "nature" as a morphological constituent, and arguably, there is a semantic connection as well. Thus a transformation of the problem takes place: a methodological naturalist, who is reluctant to speak of nature, has to answer the question, What distinguishes the *natural* sciences from the other sciences? The answer can no longer appeal to the fact that they are the sciences of nature. Criteria are needed, since it is not the usage of the word "scientific" that makes a discipline, theory, explanation, or vocabulary naturalistically respectable. All the above-quoted definitions of the naturalistic program appeal to "the scientific method(s)." In order to pinpoint the content of the program, one needs to know which methods exactly are meant by it, or *not* meant by it.

So, let us ask which methods the naturalistic program excludes. Here opinions diverge. Methodological naturalists formulate their position either with respect to a *leading science*, or without.

Naturalism with a leading science

The two main approaches of twentieth-century naturalisms with a leading science were physicalism and biologism. For some reason, no prominent naturalist has yet declared chemistry as a leading science. Sociologism cannot count as naturalism, as sociology is not a natural science. The case of psychologism is more intricate, since in the twentieth century, psychology was taught as a discipline in the humanities as well as in the empirical sciences. Frege's and Husserl's critique of psychologism is often understood as a critique of naturalism, yet the psychologism they criticized had little to do with scientific psychology. Their anti-psychologism rather insisted that questions of justification cannot be turned into descriptive questions. In today's terminology, scientifically refined positions of psychologism would count as *naturalistic epistemologies* (see the section "Naturalizing epistemology," below). So we are left with physicalism and biologism.

Physicalism: Physicalism is a refined version of materialism with reference to physics. Thus understood, physicalism is an ontological thesis. According to this view, the world consists of only those entities acknowledged by physics. Some physicalists refer to an *ideal* physics instead. Philip Pettit has categorized ontological physicalism into four partial theses:

1 There are microphysical entities.
2 Microphysical entities constitute everything.
3 There are microphysical regularities.
4 Microphysical regularities govern everything.[77]

In Pettit's fourfold claim, ordinary materialism is enriched first by reference to physical laws or regularities, and second by reference to the thesis of the primacy of a micro-level. On this thesis, there are only elementary particles, and everything else is composed of these elementary particles.

Ontological physicalism is a variety of *metaphysical* naturalism. Members of the Vienna Circle proposed a different variant of physicalism. Carnap (1891–1970) and Neurath (1882–1945) did not take "physicalism" to be an ontological position, but rather the thesis that all meaningful sentences are translatable into a universal language of science. Carnap deemed ontological claims about what there is to be senseless. His physicalism is defined methodologically, in defending a primacy of explanation by a science that is distinguished by a certain linguistic form. Carnap's version of the translatability thesis is: "*physical language is a universal language*, that is, a language into which every sentence may be translated [. . .]. This is the thesis of physicalism."[78]

This kind of physicalism was closely related to the Viennese program of a *unity of science*. In the words of Carnap: "If the physical language, on the grounds of its universality, were adopted as the system language of science, all science would become physics."[79] For Carnap, physical language does not coincide with the language of current physics. Physics keeps its status as a leading science, yet Carnap specifies it in a rather idiosyncratic fashion:

> [P]sychology is a part of the domain of unified science based on physics. By "physics" we wish to mean, not the system of currently known physical laws, but rather the science characterized by a mode of concept formation which traces every concept back to state-coordinates, that is, to systematic assignments of numbers to space-time points.[80]

Subsequently, the main impediments to pursuing the program of translation into a universal language of science were dispositional predicates and the intensional idiom (modality and intentional attitudes). The early Carnap (as well as his student Quine) defended a *principle of extensionality*; that is, he excluded intensional ("opaque") contexts from scientific language. In intensional contexts, constancy of truth-values cannot be guaranteed in cases of substitution of co-referring singular terms and in cases of existential generalization. While Carnap's version of physicalism cannot count as a variety of metaphysical naturalism, his demand to eliminate or reductively analyze the intensional idiom brings him close to a semantic-analytic naturalism, of which more below. Even today, the thesis of "the eliminability of intensionality at all levels of description or explanation" is sometimes taken to be the defining characteristic of physicalism.[81]

Quine denied his teacher's physicalism as well as logical empiricism in general the honorary title "naturalistic." Once the dream of deducing science from sense-data is over, he claimed, Carnap's method of rational reconstruction loses "the last remaining advantage … over straight psychology; namely, the advantage of translational reduction." "Why not just see how this construction really proceeds? Why not settle for psychology? […] Better to discover how science is in fact developed and learned than to fabricate a fictitious structure to a similar effect."[82]

Further issues discussed in the context of physicalism were as follows: Is the physical world causally closed? Is determinism true? Which kinds of reduction must be distinguished? Can mental and social properties be understood as supervenient properties of physical systems? Could token physicalism be true when type physicalism is not?

Biologism and evolutionary naturalism: Discussing both physicalism and biologism under the heading "naturalism with a leading science" admittedly blurs a significant disanalogy. While physicalism says, more or less, that everything is physics, almost no one says that everything is biology. Biologism is not such a broad metaphysical view as physicalism is, since it has nothing to say about the realm of inanimate nature. But it has much to say about man and his abilities, and this is what matters for naturalism. Naturalistic theories purport to explain those phenomena scientifically that do not belong to the proper study of natural science beyond dispute (see the section "Analytic, or semantic, naturalism," below pp. 274–77).

The starting point of biological naturalism is the fact that *Homo sapiens* is a species of mammal that has come about through natural evolution. For some philosophers, the recognition of this fact already marks a naturalistic position: "A philosophical approach is naturalist iff its procedures are consistent with the assumption that its subject matter has come into being as a result of evolutionary processes."[83] This condition is extraordinarily weak. Holding views that are "consistent with" the insights of evolutionary theory hardly suffices to be a naturalist. Also weak, but assuredly more poetic, is the following: "To be a naturalist is to see human beings as frail complexes of perishable tissue, and so part of the natural order."[84]

The term "evolutionary naturalism" was already in use at the beginning of the twentieth century (see also "American philosophy in the twentieth century," Chapter 5).[85] In the second half of the century, various theories were developed which widened the area of what was amenable to evolutionary explanations. Sociobiology, evolutionary epistemology, evolutionary psychology, and evolutionary ethics make the claim to explain cognitive, cultural, social, and moral accomplishments of humankind in the light of evolutionary history. These theories are more appropriately called "naturalistic," while the mere insight that human beings are mammals that evolved through history should not count as a distinctive feature of naturalism. It is true that creationists deny this claim, yet aside from these religiously motivated supernaturalists there are no serious opponents. Naturalists and non-naturalists battle over the question of which explanatory claims are associated with this insight. Many evolutionary naturalists, though, try to get by with quite weak assumptions about the natural history of *Homo sapiens*. They stress the fact *that* our physical makeup and our

abilities are the result of a contingent evolutionary history, and leave it open *how* this history has taken course in detail, and what precisely appeals to evolutionary history do explain. A popular philosophical comment on views of this level of generality is that they are either trivial or false. This comment seems appropriate in this case. The claim that the abilities of human beings are the result of natural history in the sense that we would lack them, had evolution taken a different tack, is a claim with only a smidgen of empirical content. Short of supernaturalism or creationism, it is hard to see what this view is arguing against. But this view might also have a more robust reading. Yet the more challenging the claim about evolutionary naturalism, the harder it is to corroborate.

Let us look at the "evolution of the mental." Some creatures that wander over today's earth have intentional states. This is a contingent fact, in the sense in which the existence of oxygen or the value of the gravitational constant are contingent facts. If one kept on asking on what this fact depends, or, how it could enter the world, one would have to tell two long stories, namely, the natural history of *Homo sapiens* followed by its cultural history. Since the mind did not come into being immediately with the Big Bang, it must have evolved. There must have been proto-phenomena and intermediary steps. Now it is notoriously difficult to characterize these steps, for we literally have no words for it. Our intentional idiom is tailor-made for the description of fully-fledged cognitive capacities. Some of us can even compose, play chess, estimate spring tides, or write philosophical essays. It is a hard fact that we human beings can do these things. However, it is not a natural or biological fact, since these abilities emerged over the history of mankind on the basis of a largely unchanged genetic constitution. It is a *cultural* fact, since the emergence of these features required that the *animal symbolicum* passed on acquired abilities to the next generation.

Culture has occasionally been called the "second nature" of human beings, but this parlance cannot seriously be used to buttress a *biological* naturalism. According to Arnold Gehlen (1904–76), it is part of human nature to be a cultural creature. Man, he taught, is a deficient being (*Mängelwesen*), its instincts reduced, stepmotherly treated by Mother Nature, and therefore in need of culture and institutions. In the German tradition of philosophical anthropology, reference to a second nature of human beings was widespread. It played on the ambiguity within the notion of nature. In talk of second nature, "nature" is understood in the sense of "characteristic" or "real essence," but not in the biological sense. Hence, this reference is not an expression of a naturalistic orientation of philosophical anthropology, rather the opposite. Even if human beings are by nature reliant on culture, their culturally developed abilities are not part of their natural biological endowment. Besides, it is hard to understand why many naturalists accept only those explanations in which human traits are explained with reference to sub-humane conditions.[86]

Evolutionary naturalism is the main target of attacks by creationism. Creationism is incompatible with many naturalistic theories, but it predominantly rejects Darwin's theory of natural selection. The Christian philosopher Alvin Plantinga (1932–) is an important figure in these debates. Plantinga takes naturalism simply as the negation of theism,[87] and he has developed an "evolutionary argument against naturalism,"

according to which one cannot at the same time adhere to evolutionary theory and deny that there is supernatural influence on the history of the world. His evolutionary argument against naturalism goes as follows: Only a form of evolution guided and orchestrated by God can explain why our cognitive system produces mostly true beliefs. If evolution proceeded blindly and randomly, as atheistic evolutionism claims, it would be highly unlikely that our beliefs are largely true, including the belief in evolutionary theory itself. But proponents of evolutionary theories of course claim those theories to be true. Thus, evolutionary naturalism is self-defeating. It cannot explain its own pretence of truth.[88]

The late twentieth century was a good era for biological naturalism, since owing to rapid developments in the life sciences it could renew its scientific foundations. Further issues discussed in the context of biological naturalism are as follows: Are there strict laws of biology? Do our genes determine our behavior? How can biology explain purposeful behavior? What is the relation between intentional, teleological, and functional explanations? Can biology do without what Daniel Dennett has called "the design stance"?

Naturalism without a leading science

Methodological or scientific naturalism takes scientific method as the only avenue to truth. However, methodological naturalists have to indicate what makes scientific method a method of the *natural* sciences, even if they formulate their position without reference to a leading science. In order to give their naturalistic credo a determinate content, they have to demarcate the endeavor "natural sciences" from other cognitive enterprises.

Quine famously holds that "[t]he world is as natural science says it is, insofar as natural science is right."[89] Clearly, this declaration does not contribute to distinguishing science from non-science, but rather presupposes such a distinction. One needs a positive characterization of the notion of natural science invoked in Quine's naturalism. Simply declaring, as Quine does, that "demarcation is not my purpose"[90] does not suffice, since his notion of naturalism cannot have sharper contours than his notion of the natural sciences.

Many methodological naturalists who reject a leading science refrain deliberately from specifying which scientific methods distinguish science from non-science, or good science from bad science. The reason is that they do not want to domineer over the sciences. Neither can the material findings of scientific research be identified *a priori*, they maintain, nor can the *methods* of science. Methodological naturalists do not want to anticipate what the sciences will acknowledge and develop as a methodological standard. Standards are revisable, after all. One can boil down this attitude to the maxim: *Wherever science leads, I will follow*.

This kind of naturalism appears to be attractive in that it does not commit itself to any scientific branch, theory, or program. Thus, for example Quine declared Carnap's physicalism to be unfruitful and remote from science. In turn, it has been argued that Quine's own theory of language acquisition bet on the wrong horse by relying on behavioristic psychology.[91] In the course of the "cognitive turn," behaviorism lost

a large part of its reputation to the cognitive sciences. (For a description of the turn from behaviorism to cognitivism, see "Philosophy of psychology," Chapter 13.) To put it bluntly: scientific programs come and go, paradigms are exhausted; what remains is methodological naturalism, as long as it does not commit itself to any leading science. The *scientia mensura* naturalist does not bind his fate with a particular scientific theory or paradigm, but declares his solidarity with the course of science itself. Hence Quine's favored phrase: "Science itself tells us that …"[92]

But what *is* science itself? Who exactly is allowed to care of himself in matters of method? Arguing that the natural sciences are sciences of nature does not help, for *scientia mensura* naturalism replaced reference to nature by reference to the natural sciences. Now if naturalists reject a narrower specification of scientific methods, an unsatisfactory situation results, a situation already bewailed in the debates of postwar American naturalism: "naturalism stands for scientific method; whatever rules out scientific method – that is supernatural. We are back where we were. 'Nature' means that which is open to scientific method."[93] Even more succinctly: "Naturalism excludes what is not scientifically investigable, and calls the domain of possible investigation 'nature'."[94]

Two contemporary methodological naturalists who refuse to give any definition of the enterprise of the natural sciences are the American philosophers of science Arthur Fine (1937–) and Stephen P. Stich (1943–). Fine holds that science will take care of itself in every respect. He advocates a "natural ontological attitude" which abstains from any "essentialist premises about the 'nature' of science."[95] He recommends that science is taken at its face value, rejecting "the mistaken idea that one must add distinctively philosophical overlays to science in order to make sense of it."[96] This anti-essentialist scientism indeed boils down to the maxim mentioned above: *Wherever science leads, I will follow*. Now, it is not easy to distinguish between scorn for "essentialist premises about the 'nature' of science" and the refusal to explain what one is talking about. Fine would surely not accept as science just any cognitive endeavor that anyone has ever *called* science. His maxim, "follow good science as far as science goes but do not demand that science do more"[97] at least indicates that he feels able to tell apart good science from bad science. Presumably, he would advise us to ask the good scientists about what good science is. But a charlatan or a fraud, passing himself off as a scientist, is unlikely to shy away from passing himself off as a good scientist. We may hope that, in the long term, he will not be accepted by the scientific community, but if he is clever enough in faking and cheating, it may take some time until he gets unmasked. What about his status up until then? Is he a good scientist just as long as the majority of his colleagues accepts him as a peer? Or worse yet: what if one of the next "science wars" is won by the united social constructivists and relativists, so that the good scientists Fine relies on find themselves in a minority?

For a naturalist, it is not advisable to regard membership in the scientific community as a brute sociological or institutional fact. The truth is that the peer group has *reasons* for accepting or not accepting somebody as a member. And such reasons will be needed as soon as the charlatan takes the university to court over his dismissal.

Fine's defeatism regarding the definability of the science game would simply leave the scientific community empty-handed in such quarrels.

Another methodological naturalist who seems to resort to the maxim *Wherever science leads, I will follow* is Stephen Stich. Stich takes exception to a widespread "puritanical naturalism" in the philosophy of mind. The search for a naturalistic criterion of acceptable properties or predicates, as carried out in the various armchair projects of naturalizing the intentional, he says, is "misunderstanding the way that science works."[98] According to Stich, there is no way of identifying naturalistically acceptable predicates in advance, i.e. independently of the role they play in science as practiced:

> What "legitimates" certain properties (or predicates, if you prefer) and makes others scientifically suspect is that the former, but not the latter, are invoked in successful scientific theories. … [B]eing invoked in a successful science is all that it takes to render a property scientifically legitimate.[99]

Just as Fine speaks of "good" science, Stich speaks of "successful" science. And just like Fine, Stich becomes quite taciturn when pressed for an explanation of what successful science amounts to. He says "I don't claim to have an account of what it takes to be a successful scientific theory. Indeed, I suspect that that, too, is a pluralistic, open-ended, and evolving notion." And as to "the question of whether successful science can be constructed using intentional categories … it is working scientists … who will resolve this question, not philosophers of the puritan persuasion."[100]

Again, this result is disappointing. Whatever the philosophical merits of anti-apriorism and anti-essentialism are, the advice "Ask the working scientists!" cannot by itself settle the question of what counts as good or successful science. Abstaining from setting any methodological standards or criteria that distinguish science from humbug and charlatanism leaves us with nothing but a sociological notion of science: *Everything that can be studied at a university is a science*. Or, *science is what professors are paid for*. Or, *science is what you can get money for from the National Science Foundation*. But, as is well known, weird things are taught at universities, for example that science is just another genre of literature, or that reality is but a social construction. Naturalism cannot be so liberal as to embrace all these claims as *scientific* doctrines, just because they are taught at universities by tenured professors. Affiliation to the sciences cannot only be a matter of the respective doorplate. Suppose that all professors of physics defect to a spiritualist sect overnight while keeping their chairs. Would Fine and Stich still hold that the world is just as these so-called physicists say? No, they would – one hopes – call them *former* physicists, irrespective of their doorplate. And they would campaign to re-advertise their posts. Naturalists should not only defend "the natural sciences," but they should also find something *about* science defensible.[101] If a naturalist did not dare to propose what is estimable about the sciences, he has nothing to counter an ideological redefinition of the concept of science that successfully infiltrated scientific institutions.

A final misgiving about my examination of scientific naturalism must be addressed. Why, one might ask, could not naturalism be more pluralistic? Why does it have to rely

on *natural* science exclusively, instead of including the social sciences? Philosophers such as Fine and Stich despair of spelling out a set of necessary and jointly sufficient conditions that define the science game. Why not, in the face of this difficulty, adopt a broadly Wittgensteinian view, according to which the different branches of the scientific enterprise are held together by family resemblances? Why not base scientific naturalism on a pluralistic notion of science?

This alternative view confounds two questions that are better kept apart. It is one thing to determine which views about science are worth being held, it is quite another thing to determine which views are worth being called "naturalism." Reference to the *natural* sciences is the last remaining link between naturalism and its morphological and semantical constituent "nature." Surely there are good reasons to dispute the claim that natural science is the only avenue to the truth. But these reasons are not at the same time good reasons for calling more pluralistic alternatives "naturalistic" as well.

Analytic, or semantic, naturalism

On the one hand, *scientia mensura* naturalists are anxious to delineate the scientific enterprise from other cognitive endeavors. On the other hand, they have to draw a dividing line between the natural sciences and other sciences. This is an intricate business. They must be neither too restrictive, in excluding respectable natural sciences, nor too liberal, in including just any discipline in the humanities or social sciences. From this situation, one could infer that *scientia mensura* naturalism is a hopelessly vague program. At the end of the day this assessment may be correct. This assessment would, however, ignore a project known as "analytic" or "semantic" naturalism, which is put forth in philosophy of mind. Analytic naturalism takes the view that a scientific discipline is largely distinguished by its concepts or predicates, and that the project of naturalizing is an endeavor in conceptual analysis. Instead of favoring a class of scientific disciplines, it privileges a class of naturalistically acceptable predicates. Other predicates must be analyzable as predicates of this reference class. Thus the method of analytic naturalism is reductive analysis.

As regards the reference class, it is common to favor predicates that designate physical properties of concrete objects. In fact, analytic naturalists mostly proceed in reverse order: they indicate the predicates that must *not* occur. In analytic naturalism, the view is widespread that the only criterion for naturalistic acceptability is a ban on intentional language: only those sciences, explanations, and theories are naturalistically acceptable that avoid the idiom of intentional psychology. The background for this criterion is the estimation that ascriptions of propositional attitudes (beliefs, desires, intentions, and so forth) and the associated practice of explanation, if interpreted realistically, form a serious hindrance to science. The intentional idiom of belief-desire psychology is not readily connectable to scientific theory, because any ascription of an intentional attitude can only be justified or explained in a circular way by further intentional ascriptions. Owing to this failure of connectability, belief-desire psychology does not take part in scientific progress. From the royal road to truth it has forked off into a dead-end street. Paul Churchland (1942–) formulated

this position vividly. The natural sciences, he says, explore the world in a division of labor and thus contribute to the growth of our empirical knowledge. Folk psychology is the only thing that "is no part of this growing synthesis. Its intentional categories stand magnificently alone." It is "a stagnant or degenerating research program, and has been for millennia."[102] In his *eliminative materialism*, Paul Churchland draws the ontological conclusion that no entities correspond to the intentional categories of folk psychology, that is, that *there are no such things as* beliefs, desires, and intentions. Dennett and Fodor phrase it more cautiously:

> Beliefs have a less secure position in a critical scientific ontology than, say, electrons or genes, and a less robust presence in the everyday world than, say, toothaches or haircuts.[103]

> The worry about representation is above all that the semantic (and/or the intentional) will prove permanently recalcitrant to integration in the natural order … [104]

> I suppose that sooner or later the physicists will complete the catalogue they've been compiling of the ultimate and irreducible properties of things. When they do, the likes of *spin*, *charm*, and *charge* will perhaps appear upon their list. But *aboutness* surely won't; intentionality simply doesn't go that deep. It's hard to see, in face of this consideration, how one can be a Realist about intentionality without also being, to some extent or other, a Reductionist. … If aboutness is real, it must be something else. … [T]here is no place for intentional categories in a physicalistic view of the world.[105]

There are three possible avenues for those who do not accept the autonomy of intentional psychology: analytical naturalization, eliminativism, and instrumentalism. Intentional terms should be either (a) analyzed reductively, i.e. reduced to non-intentional terms via analytic definition, or (b) eliminated and replaced by others, or (c) treated as useful fictions. Only the first option has direct bearings on naturalism. In Churchland's eliminativism and Dennett's instrumentalism, there is nothing to be naturalized, since strictly speaking the intentional realm does not exist. The program of analytic naturalization of the intentional idiom (i.e. the attempt to give necessary and sufficient conditions for applying intentional predicates) will be described in more detail below in the section "Naturalizing intentionality."

In the 1980s, many philosophers engaged in the project of naturalizing intentionality (e.g. Fodor, Dretske, Millikan, Sterelny, Lycan, Schiffer, Loar, Block, Devitt, Stalnaker, Stampe). In the 1990s, some authors argued that the significance of analytic or semantic naturalism had been overrated.[106] Stephen Stich objected that the criterion for naturalistic acceptability was both too strong and too vague. He compared the search for such a criterion with the search in logical empiricism for a general criterion of meaning. In both cases, a relation R is being searched, which a predicate or a property must have with respect to a basic vocabulary or a specifiable

empirical base, in order to be acceptable. Stich holds that in both cases one cannot state such a criterion that separates the good from the bad. All proposed criteria are either too restrictive or too liberal. They either throw out the baby with the bath water, or leave much foul water in the tub.

However, there is a blind spot in Stich's view that the recommended criteria are not apt to distinguish good from bad. This view already presupposes the idea of what counts as good and bad. Stich confines himself to the note that all that counts is that the predicates or properties in question are applied in "successful scientific theories."[107] This move is familiar now, and so is the rejoinder: A naturalist must be able to indicate what he takes to be successful science and why he does so. Moreover, the sought-after criterion does not necessarily consist in specifying a legitimizing relation R, in which intentional predicates must stand to a privileged vocabulary, as Stich assumes. Stich overlooks a crucial disanalogy between the ban on intentional concepts and the criterion of meaning in logical empiricism. The ban on intentionality has the form of a *condition of exclusion*. No basic vocabulary is privileged; the naturalist rather pledges to abstain from using certain resources. In view of this fact, the terms "semantic" or "analytic naturalism" can lead to confusion by suggesting sameness of meaning between *analysans* and *analysandum*. However, the program proposed by Fodor, Fred Dretske (1932–), Ruth Millikan (1933–), and others is not committed to such a claim, since it is possible to take the relation at hand in the sense of an extensional definition: A given intentional phenomenon, say a belief of type *p*, *is present if* certain empirical conditions are fulfilled. These conditions need not be understood as semantic components of the intentional concept. The semantic aspect of analytic naturalism consists only in the restriction for the vocabulary in which sufficient conditions are phrased.

Besides, Stich has objected to analytic naturalism on the grounds that the requirement for giving necessary and sufficient conditions for applying intentional terms is unachievably strong. Insofar as this objection targets a specific kind of conceptual analysis, it cannot be settled here. (For a rehabilitation of conceptual analysis, see "The development of analytic philosophy: Wittgenstein and after," Chapter 2.) However, let us suppose that Stich is right in arguing that one cannot pursue any interesting enterprise in the cognitive sciences under such severe restrictions. But why should this count against the criterion of naturalistic acceptability? Stich bases his rejection of the criterion on the claim that it does not separate the good from the bad. From the outset, he assumes that the criterion will reveal intentional naturalism as a good or promising project. Maybe this is asking too much. One contentious issue between naturalists and non-naturalists is precisely the question of how much good science is left if one abandons intentional terms. Consider again the parallel to the empiricist criterion of meaning: According to Stich, it speaks against logical empiricism that all proposed versions of the criterion of meaning lead to intuitively implausible demarcations between what is meaningful and what is not. Stich does not conclude that logical empiricism must have had something different in mind. In the case of the naturalistic criterion, he prefers to reject the criterion, while his own concept of naturalism remains diffuse.

Stich is a representative of the large group of philosophers whose *rhetorical* solidarity with naturalism is stronger than their willingness to commit themselves to a defining characteristic. These philosophers have misgivings against attaching much weight to semantic or analytic reductions, and they complain that the notion of analytic naturalism forces them into a position that they are not committed to qua naturalists. In a similar vein, one might ask why the philosophy of mind should be the discipline that decides the fate of naturalism, and not for example ontology, philosophy of science, or epistemology. Now, let us recall by which path the debate arrived at analytic naturalism: alternative definitions of naturalism were debunked as insufficient. It is widely accepted that naturalism is under-specified as an ontological thesis about what kinds of objects exist. In the philosophy of science, all attempts at a definition only reach the question of what distinguishes approved from pseudo-sciences. Now, an answer suggests itself. In particular, those disciplines that stick to the unanalyzable intentional idiom count as inferior and explanatorily weak. Analytical naturalism gives a criterion of naturalistic acceptability for philosophical theories and explanations. Can this demarcating criterion be seen as a specification of the *scientia mensura* maxim of methodological naturalism? On closer look, the criterion is at best only part of the answer. Analytic naturalism purports to provide a sufficient condition for *bad* science. Its criterion, though, is not a sufficient criterion for good science, since astrology or phrenology might very well be free from intentional language.

Now, a pivotal characteristic of analytic naturalism is the dynamical aspect of naturali*z*ation. One cannot in general consider the label "naturalistic theory" as synonymous with a "theory that contains no intentional terms." Otherwise, we could speak of a naturalistic mineralogy, for example. The fact that mineralogy is pursued without intentional ascriptions, however, does not count among those things over which naturalists and non-naturalists are at odds. The conditions of analytic naturalism have no application where *explananda* are given in non-intentional terms. Therefore, a science of mineralogy that is free of intentional language does not *confirm* naturalism. Converse views rest on a confusion between the terms "naturalistic" and "scientific." A theory in the natural sciences is not per se naturalistic; whether it is, depends on its area of application, among other things. Naturalistic theories purport to extend the area of application of the natural sciences to those phenomena that are not already covered beyond dispute.

If one attempts to give naturalism a more global meaning beyond single naturalization projects, then the following suggests itself: naturalism is the programmatic thesis *that naturalization is possible everywhere*. Analytic naturalism does not render metaphysical or methodological naturalism obsolete. It can be understood as a further step in elaborating upon these programs. Just because naturalists "regard human beings and mental phenomena as part of the natural order," it is their duty "to explain intentional relations in naturalistic terms."[108] At the bottom of the program of naturalizing intentionality lies the opposition of mind and nature, which can hardly be called idiosyncratic.

Three fields of naturalization

Naturalizing epistemology

The distinction into fields of naturalization – epistemology, intentionality, normativity – cuts across the above-mentioned triple classification of naturalisms. Naturalizing epistemology is not creating a new *kind* of naturalism; rather it relates naturalism to a specific *subject matter*.

In 1969, Quine entitled a programmatic essay "Epistemology naturalized." This is the succinct title of a whole bunch of epistemological theories, which occupy a peculiar intermediate position between natural science and philosophical analysis (see "Epistemology in the twentieth century," Chapter 11, pp. 508–09).[109] All these theories have in common that they reject aprioristic methods in epistemology. They highlight the role of empirical knowledge and challenge the authority of conceptual analysis, Cartesian knowledge, and introspective methods. In this spirit, Quine calls for "abandonment of the goal of a first philosophy prior to natural science." Quine's statement and several similar ones are hard to evaluate, however, for he says little about the rejected counter-positions. He never specifies systematically or historically what exactly epistemological apriorism is, except for a few notes on Descartes's foundationalism or Carnap's *The Logical Structure of the World*. It is, for instance, not clear whether the philosophical projects of Kant or Husserl fall under his notion of "first philosophy."

The central passage from Quine's programmatic essay reads as follows:

> Epistemology, or something like it, simply falls into place as a chapter of psychology and hence of natural science. It studies a natural phenomenon, viz., a physical human subject. This human subject is accorded a certain experimentally controlled input – certain patterns of irradiation in assorted frequencies, for instance – and in the fullness of time the subject delivers as output a description of the three-dimensional external world and its history.[110]

Quine's talk of experimentally controlled irradiation patterns is deliberately outlandish. In fact, he does not discuss the main question of epistemology "how evidence relates to theory",[111] in terms of laboratory experiments. As a starting point, he prefers everyday situations of observation, as in his scenario of radical translation. The alienated parlance of irradiation patterns on the surface of our bodies is intended to highlight the fact that any observation or perceptual judgment is based on the triggering of our sensory receptors: "Our only source of information about the external world is through the impact of light rays and molecules upon our sensory surfaces";[112] in short "whatever evidence there *is* for science *is* sensory evidence."[113] Thus Quine takes up and varies the rationale of classical empiricism, namely that there is nothing in the mind that was not first in the senses (*nihil est in intellectu quod non prius fuerit in sensu*).

A central topic of the debate about naturalistic epistemology is the question of how traditional and naturalized epistemology are related. In Quine's own, often-cited view, there is a certain continuity in subject matter:

> The relation between the meager input and the torrential output is a relation that we are prompted to study for somewhat the same reasons that always prompted epistemology; namely, in order to see how evidence relates to theory, and in what ways one's theory of nature transcends any available evidence.[114]

Now Quine describes input on the one hand in terms of stimuli, on the other hand in terms of "evidence" and "information." Various critics have objected that he thus levels the difference between a question of fact and a question of justification, a difference that was important to traditional epistemology (*quid facti* versus *quid iuris*). In particular, the objection reads that Quine uses the term "evidence" equivocally. Take the first sentence of *The Roots of Reference*: "Given only the evidence of our senses, how do we arrive at our theory of the world?"[115] Here, the expression "evidence of our senses" is in need of explanation. What exactly do the senses transfer, or what do they present us for evaluation? In other phrasings of the main question of epistemology, Quine replaces "evidence" by "source of information." Both terms suggest a relation of epistemic support or justification. Elsewhere, however, Quine notes: "By sensory evidence I mean stimulation of sensory receptors."[116] But how can stimulations of sensory receptors be pieces of "information," or "evidence for" our beliefs and theories? Quine often characterizes the relation at stake with pale verbs such as "depend on" or "is due to".[117] Such formulations, however, leave open the nature of the relation: is it a causal relation or rather one of epistemic support or justification?

Among others, Donald Davidson (1917–2003) criticized this ambiguity: "No doubt meaning and knowledge depend on experience, and experience ultimately on sensation. But this is the 'depend' of causality, not of evidence or justification."[118] Davidson insists that sensory stimuli or external factors in the face of which something is uttered, can never be the kind of entities that justify or ground an assertion. Otherwise, the cognitive subject would need to be able to compare the stimulations of his sensory receptors with the resulting beliefs, in order to decide whether the former support the latter. Yet for this, sensory stimulations would have to be epistemically accessible. This requires an epistemic subject that can observe the perceptual process again, a sort of *homunculus* whose working would in turn be subject to epistemological analysis. In order to avoid these absurdities, one has to distinguish the causal and the justificatory relation. Both relations cannot hold between the same relata. Davidson insists "nothing can count as a reason for holding a belief except another belief."[119]

Apparently there are two readings of the main epistemological question of how we get from stimulus to science. Quine prefers the causal reading, yet irritates the reader by using justificatory vocabulary. The causal reading, namely to "view perception squarely as causal transaction between external bodies and talking people, with no curtain to screen them",[120] does not preclude that at the same time rational relations hold between perceptual *beliefs* and theoretical beliefs. But the relata are different then, and Quine's critics point out that instead of two readings of a single question, we deal with two entirely different questions.

Quine influentially replied to the objection that naturalistic epistemologies are circular. The circularity charge, as known from Husserl's critique of psychologism, goes

as follows: Naturalistic epistemologies cannot solve the problem of skepticism, for they rely on scientific beliefs, the reliability of which is under consideration. According to Quine, any reasonable skepticism is part of science itself and motivated through science. "Scepticism is an offshoot of science," and "sceptical doubts are scientific doubts.".[121] Skepticism towards science as a whole, on the other hand, is misguided, since it is based on a misconception of the relation between philosophy and science: the misconception that philosophy has a justificatory function towards the sciences. In this vein Quine rejects the objection that he uses Darwin's evolutionary theory in order to justify induction:

> I am not appealing to Darwinian biology to justify induction. This would be circular, since biological knowledge depends on induction. Rather I am granting the efficacy of induction, and then observing that Darwinian biology, if true, helps explain why induction is as efficacious as it is.[122]

More generally, his answer to the charge of circularity is this:

> The reason I shall not be impressed by this is that my position is a naturalistic one; I see philosophy not as an *a priori* propaedeutic or groundwork for science, but as continuous with science. I see philosophy and science as in the same boat – a boat which, to revert to Neurath's figure as I so often do, we can rebuild only at sea while staying afloat in it.[123]

By turning away from *foundationalism*, Quine steals the thunder of the objection. Skepticism against science as a whole has a point only if one could expect philosophy *to provide a justification for* scientific knowledge. Once this pretension is given up, the complaint vanishes that it cannot be fulfilled.

It is also possible that Quine uses the term "sensory evidence" exclusively in a causal reading without wishing to profit from the above-mentioned ambiguity. In this case, Quine would turn out to be an epistemological *eliminativist*, as Hilary Putnam (1926–) has diagnosed:

> Taken at face value, Quine's position is sheer epistemological Eliminationism: we should just abandon the notions of justification, good reason, warranted assertion, etc., and reconstrue the notion of "evidence" (so that "evidence" becomes the sensory stimulations that cause us to have the scientific beliefs we have).[124]

In this reading, Quine's naturalized epistemology constitutes a change in topic with respect to what is traditionally called epistemology. This alternative has strongly influenced the subsequent debate about naturalizing epistemology. The eliminative variant was called "replacement naturalism," whereas the idea of holding on to old questions, which should be answered jointly with the sciences, was called "cooperative naturalism."[125] The latter, weaker view is more widespread.

Stephen Stich opts for a "weak naturalism" that states "there are some legitimate epistemological questions that are *not* scientific questions and cannot be resolved by scientific research."[126] It is questionable why such a position should still be called naturalistic.

Alvin Goldman, Larry Laudan, Philip Kitcher, Jane Duran, and Hilary Kornblith have called an epistemology naturalistic if it "considers" or "makes use of" empirical knowledge.[127] This can mean different things. An epistemologist could claim to have *considered* empirical knowledge already if nothing he says *contradicts* empirical knowledge. This requirement is too weak, of course. Even Descartes, Leibniz, and Kant appear to be naturalists then, for they too "sought to show that their ideas comported well with the best available science of their times."[128] Kitcher notably accepts this consequence.[129] However, there is a stronger version of the requirement to consider empirical knowledge. Often it means that certain *rationalistic idealizations* of traditional epistemology be revoked in favor of how epistemic subjects really function and acquire knowledge:

> [A]dvice in matters intellectual, as in other matters, should take account of the agent's capacities. There is no point in recommending procedures that cognizers cannot follow or recommending results that cognizers cannot attain. As in the ethical sphere, "ought" implies "can."[130]

This demand certainly marks a difference between theories that can be right and those that must be wrong. For if an epistemology binds the acquisition of knowledge to conditions that cannot by fulfilled by epistemic subjects like us, it is descriptively inadequate. We were not searching, however, for the difference between right and false theories, but between naturalistic and non-naturalistic ones.

Empirical research into epistemic processes, especially in the cognitive sciences, has led to surprising results. In the last two decades of the century, these results made a strong impact on philosophical epistemology. The insights into the amount of irrationality in our everyday reasoning are particularly impressive (for an overview, see "Philosophy of psychology," Chapter 13, pp. 598–604). In the face of these results, it seems wise to rethink the idealized concept of rationality that was used in decision theory and game theory, and instead focus on rationality as it is embodied in finite, imperfect beings like us. However, criticism of apriorism and idealization is barely relevant for the question of where the exact difference is between naturalistic and non-naturalistic epistemologies. In the philosophical tradition, one can always find epistemological theories in which certain empirical constraints were overlooked or neglected. Quine's behavioristic theory of language acquisition is among them. The requirement to include empirical knowledge, however, is insufficient for defining epistemological naturalism. *Disregarding* empirical knowledge was never a programmatic point in non-naturalistic epistemologies. Even Kant, the arch-apriorist, invoked a good deal of empirical psychology in his analyses; today, his psychology of faculties is criticized as being inadequate. The demand for empirical knowledge is at best distinctive if one confines it to *particular* empirical knowledge. This is a common and

tacit practice, if, for instance, findings from the cognitive sciences count as empirical, whereas Austin's linguistic phenomenology does not. But the actual uses of words in a speech community do constitute empirical evidence, possibly the only empirical clues available to conceptual analysis.[131] Without further qualification, almost everyone will subscribe to the demand for including empirical knowledge. Thus this demand cannot be a defining characteristic of epistemological naturalism. The "pure apriorism" naturalistic epistemologies warn of is only a straw man. If on the other hand only particular knowledge is meant, one is thrown back to the question of which disciplines count as the reference class. This was an open question above. Answering it is two-edged even for the *scientia mensura* naturalist. In general, it will always be rewarding for philosophers to have non-philosophical knowledge at their disposal. However, there is no reason to favor, say, cosmological or physiological knowledge over the knowledge of linguistics, law, or art history.

Scientifically minded epistemology is most interesting if instead of favoring particular bits of knowledge, it rather specifies how to *use* such knowledge, in other words, if proposals are put forth about how epistemological cooperation between philosophy and the empirical sciences should look. Scientific epistemology is valuable where it determines what *role* empirical knowledge can play in formulating worthwhile epistemic aims or virtues, for example in the framework of the *meliorative project*, which seeks to "specify strategies through whose use human beings can improve their cognitive states."[132] An important differentiation of cooperative naturalism is *reliabilism* (see pp. 474 and 482–84, in "Epistemology in the twentieth century," Chapter 11). Reliabilism identifies reliable cognitive processes, namely those that lead to knowledge with high probability. It is based on an *externalist* approach to justification, according to which a subject can be justified in his beliefs even if he is not aware of the justifying reasons or facts. Bringing such "external reasons" into play constitutes a sharp break with traditional theories of justification, which confined themselves to "internal" reasons that are accessible to the epistemic subject.

Naturalizing intentionality

The project of naturalizing intentionality is a specification of analytical naturalism. The motivation for this project – as presented by Paul Churchland above – is the view that the intentional idiom of folk psychology (the unanalyzed parlance of beliefs, desires, intentions and other intentional attitudes) is out of place in the theories of natural sciences and thus an obstinate hindrance to science. In the final quarter of the century, naturalizing intentionality was the most discussed project of naturalization. The main reason for this was the immense success of cognitive sciences in the wake of the "cognitive turn." "The development of the cognitive sciences has … made the mind the most intensely hunted game in the philosophical jungle."[133] In the philosophy of mind, philosophers such as Roderick Chisholm (1916–99), Fodor, and John Searle (1932–) rehabilitated mentalism, turning away from a behavioristic philosophy of mind. The rehabilitation of mentalism went hand in hand with developments outside philosophy, namely, "the revival of cognitivism in psychology and the advent of the computer model of the mind" (see "Philosophy of mind," Chapter 12).

A statement from Fred Dretske can serve as a first approach to the project of naturalizing the mental. Dretske describes his information theoretic based semantics as "an exercise in naturalism . . . Can you bake a mental cake using only physical yeast and flour? The argument is that you can."[134] According to this view, the mental is made up of physical ingredients, which are themselves not mental. Dretske's metaphorical formulation leaves open what kind of production or constitution is strived for (or reduction, being the converse of constitution). An *ontological* reduction of the mental to the physical is not distinctive for a naturalization of the mental. Such a reduction secures the ontological primacy of the physical, but this is compatible with quite weak conceptual and nomological relations between the physical and the mental, for example with a global supervenience thesis, which does not even presuppose token–token identities. As explained above, ontological physicalism or materialism does not in itself support specific programs of scientific investigation of the mind. Ontological physicalism is even compatible with a critical attitude toward a science of the mind, for instance with the "New Dualism" of the Oxford School. A naturalist in the spirit of Dretske searches rather for a *conceptual* reduction of intentionality. Stalnaker exemplifies this further approach: "The challenge represented to the philosopher who wants to regard human beings and mental phenomena as part of the natural order is to explain intentional relations in naturalistic terms."[135] This formulation explicitly links the project of naturalizing intentionality to metaphysical naturalism, which considers human beings and the mental as "part of the natural order."

It remains to specify what it means "to explain intentional relations in naturalistic terms." According to Fodor, naturalizing intentional phenomena means providing a set of sufficient conditions for those "in nonintentional, nonsemantical, nonteleological, and, in general, non-question-begging vocabulary."[136] Fodor and other authors entertain unsettled beliefs about whether this requires only sufficient or rather sufficient *and necessary* conditions. The latter option conforms to classical conceptual analysis. Those who confine themselves to sufficient conditions argue as follows: intentional concepts must be applicable to hitherto unknown, intelligent creatures, which crucially differ from our species, and they must be applicable to human beings under bizarre science fiction scenarios.[137]

Fodor's conjunction "nonintentional, nonsemantical, nonteleological" has a long history in the philosophy of mind. Declared naturalists often come up with analyses of intentional phenomena without immediate reference to mental entities, yet these analyses rely on intentional *presuppositions*, i.e. they depend upon the fact that other intentional phenomena remained unanalyzed. Putnam explains: "From the fact that a statement is not explicitly about anything mental it does not follow that none of its presuppositions make any reference to our cognitive interests, our way of regarding different contexts, or our intentional powers."[138] An indicator for such indirect dependence is the usage of semantical or teleological concepts. One way of reacting to the problem of intentional presuppositions is to employ a wider concept of the intentional in the first place. It is mostly non-naturalists who embark on this strategy: "Say that a property is intentional if and only if either it is a propositional-attitude property – for example, the property of believing that such and such – or its instantiation presupposes instantiation of propositional-attitude properties."[139]

Fodor prohibits semantical and teleological concepts, in addition to intentional ones. As a further caveat, he adds the clause "and, in general, [in] non-question-begging vocabulary."[140] The ban on semantical expressions implies that "meaning" or "representation" must not be used unanalyzed. Notably Quine has highlighted the close relation between the semantical and the mentalistic idiom. The reason for this is that propositional attitudes as the paradigm cases of the mental have semantical identity conditions. We ascribe to two speakers the same belief, if the linguistic expressions of their beliefs are translatable into one another. It is not surprising then that for Quine meanings are just as suspect as mental entities.

The ban on teleological expressions implies that *aims*, *purposes*, *intentions*, and *functions* must not be used unanalyzed. The ban on teleology is more contentious than the ban on the semantical. This is evident in cases where teleological characterizations are explicitly or implicitly used for a purportedly naturalistic introduction of semantic concepts. Ruth Millikan, David Papineau (1947–), Fodor, and Dretske have devised "teleofunctionalist," or "biosemantical" theories of meaning and representation. Teleofunctionalists justify their use of teleological concepts by referring to the fact that biology as a respectable science "is already shot through with ascriptions of natural teleology and that such ascriptions are not going to go away, for without them we would lose valuable generalizations."[141] This view considers the naturalistic acceptability of biology as already agreed. It gets into difficulties, however, if biology is criticized as anthropomorphic for its use of teleological concepts, as for instance an eliminative materialist, who restricts himself to a physicalist concept of nature, would not hesitate to do.

There are recurring patterns in the debates about naturalizing intentionality. In these debates, the intentional presuppositions of proposed analyses are passed around like a hot potato. The following discussion between Nat(uralist) and Nonnat(uralist) is typical: Nonnat starts off considering intentionality as the defining and exclusive mark of the mental (Brentano's thesis). Nat readily ascribes intentional states to thermostats, robots, and ants. Nonnat avows himself a species chauvinist and adduces that intentional states have semantic identity conditions, whereas artifacts and lower animals have no linguistic capacities. Nat replies with a semantics of "natural indication" (Dretske). Nonnat objects that such a semantics cannot explain misrepresentation, hence is not a correct theory of meaning for a natural language. Nat denies this by means of relativizing representational content to normal conditions, or to biological "proper functions" (Millikan). Nonnat points out that teleological concepts are forbidden. Nat appeals to biology as a respectable science. Nonnat is not impressed and quotes from Kant's *Critique of Judgement*, that purpose must remain a "stranger in natural science" (B 320/§72). Nat now distinguishes between purposes and functions; evolutionary theory, he claims, gets along with the latter. Nonnat is still not impressed, functions are no less teleological than purposes. Besides, he claims that, after dropping anthropomorphic connotations, the concept of selection is unintelligible. (Typically, the debate stagnates at this point, for both opponents insist on their position.)

After this see-saw debate, Nat may try disposing of intentional presuppositions of teleological explanation by resorting to "homuncular functionalism" and its strategy of

"recursive decomposition" (Dennett, Lycan): functions to fulfill, or problems to solve, must be decomposed into partial tasks, until the postulated agents are so dumb that they can be replaced by a mechanism. Nonnat objects that the gap to mechanistic descriptions cannot be closed this way, for even dumb homunculi remain homunculi, as long as they are the addressees of instructions. Nat may introduce the "robot reply," according to which intentional predicates can only be applied literally to machines if these machines have receptors and effectors. Nonnat considers the abilities to perceive and act as requiring intentionality, thus again defending species chauvinism plus supporting a thesis of linguistic dependency of intentional states, perhaps through a Davidsonian semantic holism. Nat either reintroduces "natural signs," which delimit semantic holism, or he loses his patience and resorts to Dennett's instrumentalism, denying a difference between "real" and "only ascribed" intentionality.

Debates about naturalizing intentionality typically go round in circles. They may take shortcuts or detours, but no matter where one starts, eventually one reaches the point where the journey began. It is the well-known *circle of intentional concepts*, according to which

> it is not possible to give a logical analysis of the intentionality of the mental in terms of simpler notions, since intentionality is, so to speak, a ground floor property of the mind … Any explanation of intentionality, therefore, takes place within the circle of intentional concepts.[142]

Eventually, the point of disagreement comes into sharp focus: *The program of naturalizing intentionality is committed to the view that the intentional circle can be broken*. Were it possible to formulate sufficient non-intentional conditions for any intentional phenomenon, the naturalist could count on the domino effect. This is Fodor's conclusion: "Given any … suitably naturalistic break of the intentional circle, it would be reasonable to claim that the main *philosophical* problem about intentionality had been solved."[143]

The non-naturalist does not have to maintain positive theses in such debates. His task is simply to prevent the naturalist from eating the forbidden fruit. Sure, forbidden fruit is sweetest, but sooner or later, the naturalist will have to give an analysis of an intentional phenomenon in non-intentional and in non-question-begging vocabulary. The insight that such debates yield is not *that* intentional concepts form a closed circle. Many philosophers have discovered this before. What we gain is a new insight into the *size* of the intentional circle, into the *amount* of phenomena circumscribed by it. Quine and Churchland maintain that the intentional idiom stands "magnificently alone"[144] in the face of natural science, which alone describes the "true and ultimate structure of reality."[145] If once the debate about analytical naturalization of intentionality has become history, it will probably have emerged, *pace* Quine and Churchland, that the attempt to isolate the intentional idiom rested on a misconception. Intentionality is more pervasive than naturalists and eliminativists think. Dramatic book titles such as *Intentionality in a Non-Intentional World* (Jacob), *Reasons in a World of Causes* (Dretske), or *Mind in a Physical World* (Kim) express this misconception.

Not the smaller part of our knowledge, but most likely the larger is riddled with, or presupposes, intentional notions. This is a conclusion drawn by some contemporary non-naturalists, such as Hilary Putnam and Lynne Rudder Baker (1944–):

> It does not look as if the intentional can simply be reduced to the non-intentional; rather, it begins to look as if the intentional intrudes even into our description of the non-intentional, as if the intentional (or, better, the cognitive) is to some extent ubiquitous.[146]

> Intentionality abounds, and the significance of the distinction between what is intentional and what is not intentional has been overblown: The fact that being a carburetor has intentional presuppositions has no bearing on the objectivity of carburetors … *Pace* Quine, there is no a priori reason to be suspicious of a science whose domain is defined in part by intentional properties.[147]

The project of naturalizing intentionality takes an exceptional position among other projects of naturalization. This holds even with respect to the project of naturalizing epistemology. In order to discuss questions of acquisition and justification of beliefs, we have to suppose that beliefs *exist* in the first place. Beliefs, however, are individuated by their semantic contents. This implies that the decision relevant for naturalism is pre-positioned. Whether epistemology deals with naturalistically respectable phenomena is not settled in epistemology, but depends on success or failure of naturalizing intentionality. In short: epistemology presupposes intentionality on pain of changing the subject.[148] It is because inquiries into the possibility of naturalization should rather explain than presuppose intentional phenomena, that the real battleground is the philosophy of mind, rather than epistemology.

Naturalistic theories of *meaning* and of *representation* and of *action* are not alternatives to the project of naturalizing intentionality, but partial projects of this overarching endeavor. Linguistic meaning and intentional action are themselves intentional phenomena, and projects of naturalization aim at the very intentional dimension of these phenomena. Intentionality is the common denominator of mind, meaning, and action.

Naturalizing normativity

Normativity divides into moral and non-moral normativity. The projects of naturalizing normativity are divided accordingly.

Ethical naturalism is concerned with naturalizing moral normativity. This kind of naturalism is known from the debate about the *naturalistic fallacy*. Ethical naturalists hold that moral judgments can be deduced from non-moral facts, or that moral properties can be defined by non-moral properties. They believe that in this enterprise, the naturalistic fallacy can be avoided; or alternatively, that for some reasons it is no fallacy at all.[149]

The meta-ethical discussion of the twentieth century was particularly influenced by G. E. Moore's *Principia Ethica* (1903) (see "Kant in the twentieth century," Chapter 4 and "Twentieth-century moral philosophy," Chapter 20). Up to the second half of the century, it was widely accepted that Moore had struck a blow against ethical naturalism, strong enough to prevent recovery. Moore warned against "the fallacy which consists in identifying the simple notion which we mean by 'good' with some other notion."[150] He tried to show that any reductive definition of "good" in terms of natural properties is doomed to fail. For this purpose he introduced his "open question argument," according to which "good does not, by definition, mean anything that is natural; and it is therefore always an open question whether anything that is natural is good."[151] "[W]hatever definition be offered, it may always be asked, with significance, of the complex so defined, whether it is itself good."[152]

Moore's view that the meaning of "good" is unique and non-definable should be distinguished from the more general view that the moral *ought* is by no means reducible to the factual *is*, as stressed by Hume and Kant. The meta-ethical debate after Moore has concentrated on the question of whether moral properties are natural properties or not. If non-naturalism is framed in terms of the is–ought gap instead, one is not committed to locating the essence of morality in *properties* of anything, an idea that Kantians would reject.

Post-Moorean ethical naturalism is a meta-ethical position. It can be expressed without using the concept of nature. Now, unlike methodological naturalism, which replaces "nature" with the natural sciences in the spirit of the *scientia mensura* maxim, in ethical naturalism the notion of nature gets replaced with *descriptively ascertainable facts* or *properties*. The pivotal antitheses are *descriptive* versus *prescriptive*, *facts* versus *norms*, and *is* versus *ought*. Accordingly, Hare (1919–2002) suggested replacing the term "naturalistic fallacy" (already considered unfortunate by Moore) by the term "descriptivistic fallacy."[153]

Yet the parlance of descriptively ascertainable facts has never superseded the familiar terminology. Many ethical naturalists continue to speak of "natural facts" or "natural properties," so that the question about the meaning of the epithet "natural" resurfaces. What exactly does the naturalness of a natural property or fact consist in? Moore himself took natural properties as properties "with which it is the business of the natural sciences or psychology to deal."[154] This explanation is not very illuminating, and it raises the question of what sciences count as natural sciences. Many professed ethical naturalists argue for including the social sciences. There are good reasons for acknowledging social properties and facts, but as indicated above, these reasons are at the same time good reasons against calling the respective enterprise naturalistic. Elsewhere, Moore gave another explanation: "A property is natural if it does not depend on the existence of its object."[155] The problem with this view is that given an Aristotelian (as opposed to Platonist) view of universals and their instantiations, no properties come out as natural.

The question of which properties or facts count as natural leads to problems of demarcation, which already troubled naturalism in theoretical philosophy. Those who prefer not to answer this question are better off with *moral realism* than with

naturalism. According to moral realism, moral facts exist that are independent of our beliefs. Unlike ethical naturalism, realism does not insist that those facts are natural facts. The opponents of moral realism are the whole array of *non-cognitivist* ethical theories: subjectivism, intuitionism, emotivism, expressivism, and prescriptivism.

The second key figure in the discussion about ethical naturalism is Richard Mervyn Hare. Hare drops all reference to the natural sciences and what it is their business to deal with. Instead, he assumes that all genuine properties are natural, insofar as they belong to the causal, empirically accessible order of things. Ethical naturalism he frames as the view that normative and evaluative concepts are definable entirely in terms of non-evaluative concepts.[156] Like Moore, he considers ethical naturalism as a failed enterprise.

John Mackie's "argument from queerness" is a further anti-naturalistic consideration. Mackie (1917–81) states that values "are not part of the fabric of the world,"[157] insofar as they possess imperative force and guide our actions. He argues that a property with "to-be-doneness" built into it would be "utterly different from anything else in the universe"; in a nutshell: "queer."[158]

Post-Moorean ethical naturalism being a meta-ethical position, it is important to distinguish it from the phenomenon of an immediate *appeal to nature* for the purposes of moral justification. In such appeals, the concept of nature does play a role. Nature or the natural are taken as the guideline for moral conduct, or source of moral norms. Such views are subsumed under "ethical naturalism" as well. Historically, they are older than meta-ethical naturalism (the Stoics propagated the slogan *naturam sequi*). Appeals to nature, the natural, or naturalness for moral instruction did not disappear with the rise of meta-ethical naturalism alias descriptivism.

Since ethical naturalism is already discussed in "Twentieth-century moral philosophy," Chapter 20 and "Kant in the twentieth century," Chapter 4, I will restrict myself to the following tangential issues: (1) the issue of non-moral normativity, and (2) the surprisingly scarcely discussed question of how ethical naturalism relates to naturalism in theoretical philosophy.

(1) The phenomenon of non-moral normativity appears to be less clear-cut than the ethical *ought*, for its place in nature is not necessarily specified with reference to human action. Those who advocate non-moral normativity and situate it in nature typically invoke an Aristotelian conception of nature, according to which natural substances (*ousiai*) exhibit a kind of built-in teleology. A representative figure is Philippa Foot, who attributes "natural goodness" to all living beings. Natural goodness, she holds, is an "intrinsic" and "autonomous" form of goodness "in that it depends directly on the relation of an individual to the 'life form' of the species. […] The way an individual *should be* is determined by what is needed for development, self-maintenance, and reproduction."[159] This reference to species-relative biological needs is supposed to explain why "Aristotelian categoricals" such as "Cats are four-legged" are "able to describe norms rather than statistical normalities."[160] The antonym to "natural goodness" is not "evil," but "defect."

Aristotelians do not consider themselves hit by the naturalistic fallacy charge, for they exploit a normatively meaty, teleological concept of nature in the first place. Not

considering oneself to be hit and not being hit are two separate things, though. Even an Aristotelian concept of nature is in need of justification and defense against objections. In particular, the worry needs to be addressed that in modernity, the Aristotelian springs of natural teleology have run dry.

One can try to establish that the alleged naturalistic fallacy is not fallacious in various ways. For one thing, there might be no fallacy because the *missing link* between *is* and *ought* has been discovered. Many philosophers have worked on constructing a traceable inference from descriptive to normative sentences. One example is Searle's account of institutional facts with built-in commitments. Other authors have introduced facts about basic needs or vital interests as sources of normativity.

Many accounts of non-moral normativity are not based on a teleological concept of nature, but retain instead the close connection to human actions and evaluations. These accounts still deny that all norms, standards, and rules have a *moral* content, but they do not hold that the phenomenon of normativity can be understood without any reference to human agency, i.e. to sentient beings who can understand and comply with requests. Normativity need not be grounded in morality, but at least beings seem to be needed who can follow *prudential* norms. Various philosophers have talked about the normativity of *meaning*, *language*, *mind*, and *rationality*. For Davidson, intentionality and rationality are essentially normative, insofar as intentional predicates sort their entities according to the principles of coherence and rationality, which have "no counterpart in the world of physics."[161] Intentional behavior of persons, he claims, is holistically embedded in a comprehensive pattern of interlocking attitudes. Its interpretation is constrained by normative considerations. In interpreting the utterances and other actions of persons, revisions might be necessary in the light of later evidence. This kind of reinterpretation guided by considerations of overall cogency has no counterpart in scientific theories, since "in the natural sciences, reasons and propositional attitudes are out of place, and blind causality rules."[162]

A hotly debated issue is the alleged normativity of *meaning*. This debate originates from a phenomenon in need of explanation, namely that there are right and wrong uses of expressions. Now "right" and "wrong" are clearly normative notions, as are "sense" and "nonsense." Classifying a parlance as wrong or nonsensical presupposes some norm or standard. The *locus classicus* of the slogan "meaning is normative" is Kripke's interpretation of Wittgenstein's considerations on rule-following.[163] Yet what exactly is meant by "using a word incorrectly," i.e. by producing a linguistic error? According to Wittgenstein's influential approach, it simply means to infringe upon a linguistic norm or convention. For Wittgenstein, analytic sentences are best viewed as *rules* not as assertions. Their normative status explains why they cannot be refuted empirically. The later Wittgenstein even holds that what he calls "grammatical sentences" are devoid of truth-value. Furthermore, he demands that there must be a difference between following a rule and just *believing* that one is following a rule. This difference would collapse if someone could follow a rule *privatim*. Linguistic rules need to be stabilized by public use, hence the very notion of a private language is incoherent. Wittgenstein's way of anchoring rule-following in a shared practice or form of life, however, corresponds rather to socializing than to naturalizing the normativity of meaning.

On closer examination it is far from clear what the alleged normativity of linguistic rules or meaning postulates consists in. Suppose norms and rules are always directions for action. Directions, or imperatives, may either be categorical or hypothetical (conditional), i.e. of the type "If you want to achieve *p*, you must do *q*." The difficulty lies in the fact that one cannot ask a speaker to mean a certain thing with his words. According to Wittgenstein, it is impossible to say "green" and mean "blue," for only within a language can one mean anything. It is not up to individual speakers what their words mean (the opposite view is sometimes called a *Humpty Dumpty* theory of meaning). Rules of meaning are, in other words, *constitutive* rules, not regulative ones. Constitutive rules *define* what counts as a particular linguistic or non-linguistic activity. They resemble game rules in this respect. If someone does not play by the rules, we might say "You may move your castle diagonally, but then we are no longer playing chess." Of course, one can refuse to play chess. It seems, however, pointless to question the rules of chess. Wittgenstein remarks "it has no meaning to say that a game has always been played wrong."[164] The claim that no one has ever played chess correctly would be hard to understand. Chess is so *called* as a game arranged in a certain way. And we have played according to these rules, even if we revise them one day. As constitutive rules they cannot be "false."

There is the question of whether constitutive rules can be simultaneously normative, i.e. prompt us to do something. If it is not up to the speakers to endow their words with certain meanings, then it does not make sense to ask them to do so. In this respect, the only sensible advice is the following: "If you want to be understood, you should use your words according to the convention of your speech community. For example, you should call only green objects 'green'." This piece of advice can hardly be called a rule of meaning. It is rather a *prudential* norm, as such connected with the expectation that in pursuing their goals, human beings are well advised to proceed rationally. Some say that the normativity of meaning consists in the fact that a speaker's use of words is always subject to criticism by the relevant linguistic community. Now it is certainly *possible* to use "green" to refer to non-green objects, but it is unwise. If this is the correct view, then the normativity of meaning is grounded in the normativity of rationality.

It is hardly surprising that the question of whether a naturalistic account can be given of non-moral normativity has not yet found any consensus. The very phenomenon of non-moral normativity seems to be more elusive than the moral *ought*. Only the latter is clearly tied to imperatives, either hypothetical or categorical. There is another unsettled question, namely how moral and non-moral normativity are related. On the one hand, the moral *ought* appears to be a partial problem of normativity. On the other hand, from a Kantian perspective it is the explicative basis for normativity as such. Seeing things this way, one would have to lay out the explicative primacy of moral *ought* in two steps. First, it would be necessary to show that norms directly or indirectly constitute directions to do or say something. Second, it would be necessary to show that "you ought" cannot be elucidated from hypothetical imperatives alone, but only from categorical ones.

Within naturalistic *epistemology*, there is a discussion on the phenomenon of normativity and the naturalistic fallacy, too. This is not surprising, if epistemology

is concerned with questions of justification, not only with questions of fact. The naturalistic epistemologist Laudan has developed a "normative naturalism," according to which epistemic norms are to be understood as instrumental norms, which give the appropriate means for reaching certain goals.[165] Quine proposes a similar account of epistemic norms. In case we are forced to revise our web of belief in the face of recalcitrant experience, Quine appeals to the principles of *simplicity* and *conservativism*. Both are normative principles, which cannot be read off from the descriptive content of scientific theories. Quine holds that "normative epistemology gets naturalized as a chapter of engineering: the technology of anticipating sensory stimulation."[166] As a comment on the prospects of bridging the is–ought gap, this account misses the point, for it does not answer the crucial question of where on earth the normative "ought" is to be taken from. Some desirable aim of scientific practice must be justified first, such that the means can be considered instrumental or technological rules.

(2) Scarcely discussed in the literature is the question of how ethical naturalism is related to projects of naturalization in theoretical philosophy. The assumption seems only natural that a thoroughly naturalized account of human beings and their abilities should *comprise* ethical naturalism. On second thoughts, however, this assumption is less plausible. Why should a completely naturalized anthropology include the possibility of deducing normative from descriptive sentences? The assumption seems more plausible that in a completely naturalized anthropology the phenomena of morality and normativity would vanish altogether. In his *Anthropology from a Pragmatic Point of View*, Kant distinguished between "what nature makes of [man]" and "what *man* as a free agent makes, or can and should make, of himself."[167] A thoroughly naturalistic view of human beings might have the effect that Kant's second question merges in the first, insofar as under naturalistic assumptions there is nothing left for human beings to make of themselves.

Kant's condensed formulation is very precise. He says that a human being is a *free* agent, that he *can do* something (has certain abilities), and that he *ought to*. Naturalizing these properties and abilities is a task for theoretical naturalism, not for ethical naturalism. This also holds for the third characteristic, moral ability. Naturalizing this ability is not the same as deducing normative claims from anthropological insights into the nature of humans.

Now the logical autonomy of normative matters does not exclude less tight connections between theoretical and ethical naturalism. Even if naturalizing human capacities does not bridge the is–ought gap, something akin could be the case. Anthropological naturalism could have implications for ethics, implications concerning the necessary conditions of morality, rather than the content of moral rules. A successful naturalization of mind, reason, culture, freedom, or human abilities might eliminate the presuppositions on which the alleged autonomy of ought-sentences is grounded. Presumably, theoretical and ethical naturalism are related in this indirect way. Suppose a naturalistic anthropology proves those traits of human beings illusionary which are the *prerequisites of moral accountability of actions* or *necessary conditions for the development of normative practice*. This would not bridge the is–ought gap, but it

would make the phenomenon of morality homeless. A thoroughly naturalistic anthropology would render the fact inexplicable that something *ought to* be the case in the first place. Recall that "'ought' expresses a kind of necessity and of connection with grounds which is found nowhere else in the whole of nature. […] When we have the course of nature alone in view, '*ought*' has no meaning whatsoever."[168] An *ought* cannot be found in non-human nature, for there is neither an addressee for ought claims, nor a claiming subject. Ought claims may be logically autonomous, in not being deducible from descriptive statements, yet their *existence* is not unconditional. For Kant, human beings are committed to the moral law without ifs and buts, but only qua rational creatures who can choose their actions. Morality needs a *bearer*. In a world without beings who understand claims of ought and who can act for reasons, there would be no phenomenon of moral ought.

So even if moral facts should exist independently of our beliefs, as both ethical naturalism and ethical realism hold, they are not independent of the existence of rational beings who can act for reasons. In this respect, the phenomenon of morality has been compared to *secondary qualities*.[169] Morality presupposes abilities and characteristics of acting subjects. It would be deprived of its *ratio essendi*, if these presuppositions were regarded as illusionary. Such a position would not be ethical naturalism, but rather *deontic nihilism*. Deontic nihilists cannot understand what it means that something *ought* to be the case at all, either in moral or non-moral matters.[170] They adhere to Wittgenstein's dictum that the world is everything that *is* the case, being blind to the phenomenon of ought.

Therefore the conjunction of theoretical and ethical naturalism is presumably not a consistent position. A full-blown naturalism in theoretical philosophy amounts to deontic nihilism, for it cannot reconstrue the anthropological presupposition of the accountability of actions, which are a fortiori the condition of the possibility of morality. Ethical naturalism, on the other hand, has to hold on to those presuppositions, in particular on to the freedom of choice, as long as it understands the appeal to natural facts as the request that one ought to act in a certain way. Ought-sentences would be pointless, if it were not up to us to follow them or reject them. By the same token, praise and blame would be pointless if the agent could not have acted otherwise.

Naturalism and human nature

For some naturalists, appeals to human nature play an eminent role. But not any kind of reference to human nature indicates a naturalistic position.

In his book *Skepticism and Naturalism*, Peter Strawson distinguishes "two species of naturalism." In addition to strict scientific naturalism, he says, there is a second, liberal, and non-reductive naturalism of *human* nature.[171] As an example of this non-reductive naturalism, Strawson refers to David Hume's view that our very nature leaves us no choice but to believe in the existence of the external world. We are naturally disposed towards realism rather than towards skepticism about the external world. Strawson generalizes this view, holding that it is "simply not in our nature" to

give up certain beliefs, attitudes, and convictions.[172] From this perspective, even the late Wittgenstein appears to be a naturalist, insofar as he holds the view that some assumptions which underlie all questions and all thinking are exempt from doubt, and that certain language-games are such that we cannot help but play them.[173]

Similarly, Jennifer Hornsby (1951–) defends a position in the philosophy of mind that she labels "naive naturalism."[174] She is concerned with justifying the ascription of beliefs, desires and intentions in view of the fact that these concepts have no place in scientific theories. Hornsby maintains that it is simply in the nature of human beings to entertain mental attitudes. According to "naive naturalism," human nature gets not only described in scientific theories, but is also reflected in commonsense insights.

In the field of ethics, Martha Nussbaum (1947–) appeals to human nature in the context of her neo-Aristotelian "capabilities approach." She explicates this appeal as a reference to deeply enrooted self-interpretations of human beings: "beliefs that are so firmly a part of our conception of ourselves that they will affect our assessment of questions of identity and persistence".[175]

In Strawson, Hornsby, and Nussbaum, the concept of nature plays a different role than in metaphysical or scientific naturalism. In talk of human nature, the concept of nature is used in the sense of "essence" or "real character." This second meaning of the word "nature" can already be found in ancient Greek. It deals with the nature of things, while the first deals with things of nature.

It is questionable to what extent an appeal to a human nature can be called "naturalistic." Strawson and Hornsby use this term, yet arguably they exploit the ambiguity of the word "nature." My argument against their use of "naturalism" is simple. Even non-natural objects can have a nature in the sense of essential properties. A soccer ball is round and a match lasts 90 minutes – that lies in the nature of the things, namely the nature of the ball and of the soccer match. However, it does not make ball and match objects of nature (as a designation of a certain domain). If reference to the nature of things would suffice to constitute naturalism, then every *essentialist*, i.e. anyone who ascribes essential properties to things, would count as a naturalist. Yet there are good reasons for not using the notion of naturalism that way. After all, human beings have not only a species-specific *physis* in the sense of a biological nature, but also other essential properties. The absurdity of the view that appeals to human nature amount to naturalism is particularly conspicuous in philosophical anthropology. According to Arnold Gehlen and many others, it is in the nature of human beings to have to rely on culture and civilization, being deficient beings with limited instincts and poorly equipped by nature. Gehlen's thesis of compensation, prefigured in Plato's *Protagoras*, culminates in the jargon about culture as "second nature" of human beings. Again, appeals to a second nature of human beings play on the ambiguity of the word "nature." Talk of second nature does not reveal a naturalistic orientation of philosophical anthropology, quite the contrary. Even if it is in the nature of human beings to be dependent on culture, culturally developed abilities are not part of their natural, biological endowment.[176]

Hence, talk about "nature" in the sense of "essence or real character" does not – *pace* Strawson and Hornsby – render an account naturalistic. Appeals to the nature

of human beings are often decidedly non-naturalistic in spirit, even if they make extended use of the word "nature."

Scientific naturalism *quo vadis*?

Scientia mensura *and the disunity of the special sciences*

Above I distinguished two continuity theses in Quine. The thesis about a methodological continuity between philosophy and natural sciences is characteristic of Quine's naturalism. The thesis about continuity between philosophy and common sense shows his indebtedness to American pragmatism. Some writers, however, regard the latter continuity thesis as a defining feature of naturalism as well. For instance, Sidney Hook writes: "Naturalism, as a philosophy, is a systematic reflection upon, and elaboration of, the procedures man employs in the successful resolution of the problems and difficulties of human experience."[177] This use of "naturalism" is infelicitous. Plausibly, the naturalist's distinguishing trait is his reaction in the case of *conflict* between common sense and science. Since the Quinean naturalist holds that science is the highest path to truth, scientific investigations must in some way be superior to commonsense ways of determining truths about the world. As Arthur Danto (1924–) saliently points out:

> Science reflects while it refines upon the very methods primitively exemplified in common life and practice. [...] Should there be a conflict between common sense and science, it must be decided in favor of science, inasmuch as it employs, but more rigorously, the same method that common sense does and cannot, therefore, be repudiated without repudiating common sense itself.[178]

For the naturalist, science is not only a continual extension of common sense, but at the same time its better half. Everything that common sense can find out science can find out as well, but science is more reliable and more accurate, and it has special methods and tools at its disposal when things get complicated. This is why science has the last word in cases of conflict.

Accordingly, there is a certain tension between the pragmatistic thesis of continuity and *scientia mensura* naturalism. The continuity thesis is a fair weather thesis that is of little help if common sense and science come into conflict. There is a further tension within scientific naturalism, insofar as the commitment to scientific method presupposes homogeneity between the special sciences, which is a counterfactual assumption. Among the scientific disciplines, we find not only cooperation and division of labor, but also boundary disputes – for instance between psychological and physiological explanations of mental disorders; or between nativist and non-nativist theories about the relative importance of socialization and genetic dispositions. If no scientific discipline is privileged, such conflicts cannot be solved by naturalistic arguments in favor of the "harder" discipline, whatever the naturalist may mean by "harder." If the scientific caravan splits, then *Wherever science leads, I will follow* is not

a maxim one can follow. A *scientia mensura* naturalist is then left with the following options. (1) He could present a list of approved scientific disciplines; (2) He could privilege a leading science; (3) He could commit himself to a unified science program or to some shrunken version of it; (4) He could refrain from appealing to *natural* science and use the concept of science liberally, thus including the humanities and social sciences as well.

The fourth option is not reasonably related to the naturalistic program. Ironically, (4) could fall under the concept of *scientism*. If we take seriously the lament of Quine, who finds it "awkward that 'science', unlike *scientia* and *Wissenschaft*, so strongly connotes natural science nowadays,"[179] then it should be possible to advocate scientism without advocating naturalism. Such a position would accept the *scientia mensura* maxim without identifying science with the natural sciences.[180] Admittedly this would be an unorthodox use of "scientism."

The problem of the third option is that the unity of science is not a fact, but a project. Jerry Fodor submitted a now classical argument for the "disunity of the special sciences": generalizations may be explanatory powerful in one discipline, but not in the other. Sometimes they cannot even be expressed in the vocabulary of both disciplines. The special sciences *cross-classify* their natural kinds.[181] In addition to classificatory differences, there are also those in methodology. Denying or explaining away the actual differentiation of the special sciences is hardly a promising enterprise: *Hell is paved with failed unified theories*. Simply *stipulating* the unity of science instead goes against the spirit of scientific naturalism. It is unnaturalistic to customize science to a certain philosophy of science, rather than vice versa. The resulting tension for scientific naturalism has been described thus:

> A tension which has been ignored by the proponents of naturalized philosophy of science has been introduced into their program. On the one hand, naturalism demands unified method. On the other hand, naturalism also demands that the philosophy of science be true to science as practiced, and, *pace* the positivists, science itself has been shown not to be unified in its method.[182]

So only the first two options are left, that is, presenting a list of approved scientific disciplines, or privileging a leading science. Quine serves as a good example for discussing both options. In explicating his version of naturalism, Quine advises us to make use of scientific knowledge of any kind: "[M]y position is a naturalistic one … All scientific findings, all scientific conjectures that are at present plausible, are therefore in my view as welcome for use in philosophy as elsewhere."[183] Yet what does Quine mean by "all" scientific findings? Apparently, not findings from all subjects taught at university. Although he never presented a list of approved sciences, his practice is telling. He refers to half a dozen disciplines, and never mentions others. In particular, he refers to behavioristic psychology, physics, evolutionary biology, parts of linguistics, logic, and mathematics. This list is longer than that of many other naturalists, but it is still biased. Besides, *offering* a list of approved sciences is not enough, one has to argue

for it. In some programmatic passages, Quine's liberality finally goes astray. While logic and mathematics are related to all disciplines, he arranges the empirical sciences into a hierarchy, at the top of which is physics. "Physics investigates the nature of the world," whereas biology is only concerned with a local "bump," and psychology with a "bump on a bump."[184] Explanations that employ linguistic and behavioral dispositions are taken only as a substitute for physical explanations;[185] mental entities are hypothetical posits, standing in for still unknown physiological mechanisms.[186] When it comes to limning "the true and ultimate structure of reality,"[187] there is no place for intentionality and the propositional attitudes. Brentano's insight into the peculiarity of the intentional shows "the baselessness of intentional idioms and the emptiness of a science of intention."[188]

Hence, Quine is by no means as large-hearted as suggested by his sweeping notion of a "total science." When push comes to shove, he tends towards physics chauvinism, rather than readily using "all scientific findings" from all disciplines. In Quine's work, there is an unsolved tension between a general scientism that preserves neutrality and a physicalism plus extensionality thesis, which bans intentionality and intensionality from the sciences.

It is hard to see how the naturalist should answer from his own resources the question of which scientific disciplines exemplify scientific method(s) best or paradigmatically. In any event, Quine's refrain "science itself tells us" or Sellars's *scientia mensura* maxim cannot answer it. If the sciences are methodologically manifold, those maxims lose their radiance. In the end, the two options "naturalism with a leading science" and "naturalism without a leading science" are not so far apart. In the first event, arguments are needed for privileging the leading science. In the other event, arguments are needed in favor of a continuity relation between the sciences strong enough for *scientia mensura* naturalism.

The business of philosophy

A final challenge for scientific naturalism is the question which role, if any, is assigned to philosophy. If we accept Quine's dictum that for the questions "what there is" and "how we know what there is, … the last arbiter is so-called scientific method,"[189] then it becomes doubtful what is left for philosophy to do in this enterprise. The scientific naturalist has to explain what role he envisages for a naturalistic *philosophy*, *after* he has given his commitment to the explanatory privilege of the natural sciences. Programmatic naturalistic texts, often flavored with polemics, rather cloud the issue,

> the chief divisions being not so much between naturalists and antinaturalists […] but between competing views of what *philosophy* is. And here the critics of naturalism are not necessarily antinaturalistic in the comfortable sense of being unhappy with science, in proposing that there are nonnatural entities, etc., but rather in the sense of supposing philosophy has its own problems and techniques.[190]

The suspicion that for philosophy there is nothing to do in the project of scientific naturalism can be hardened into an objection: the credo of naturalists that the methods of natural science provide the only avenue to truth is precisely *not* a finding of any natural science.[191] This implies that the truth of scientific naturalism cannot be established by those means that allegedly provide the only avenue to truth! Critics of naturalism have turned the knife in this wound: "Methodological naturalism is a claim about best method; yet the methods employed to arrive at methodological naturalism are not those of natural science but of philosophy of science."[192] A similar objection was already put forth in the debate about mid-century American naturalism, namely that the "apparent main thesis of naturalism" is no thesis at all, but "strictly an enunciation of policy. In effect they say: 'Let us be scientific'. … What causes the difficulty is that having said: 'We are going to do science', they do not do science."[193]

Given that Quine was the prototypical philosophical naturalist of the twentieth century, it seems only fair to conclude with his own job description for naturalistic philosophy. "Naturalistic philosophy," Quine submits, "undertakes to clarify, organize and simplify the broadest and most basic concepts, and to analyze scientific method and evidence within the framework of science itself."[194] With suitable omissions, the passage reads: "Naturalistic philosophy clarifies concepts and analyzes scientific method." This job description is remarkably traditional, and it does not fit well with Quine's naturalistic avowals. Naturalistic philosophy seems to be, in a word, conceptual analysis, though "within the framework of science itself." What precisely this addition means is anything but obvious. And while Quine's naturalistic avowals had a huge impact on the scientific community in the second half of the century, his celebrated blurring of the boundary between philosophy and natural science had little effect on the way he himself actually philosophized. His own writings clearly belong to philosophy and logic, and not to some other scientific discipline. Even if names of disciplines should be nothing but "technical aids in the organization of libraries,"[195] librarians know pretty well on which shelf Quine's books are to be placed. "Quine offered a new job description for philosophy," Steve Stich stated in his obituary.[196] One can agree with this only with the qualification that changing a job description is one thing, while providing somebody with a new job is quite another.[197]

Notes

1 R. W. Sellars 1922: i.
2 Geach 1977: 52.
3 R. W. Sellars 1922: i.
4 Dewey 1944: 2.
5 Bouwsma 1948: 13.
6 This has been acknowledged quite early on, for instance by Ralph Perry: "The attacks upon the method of science have tended to create the supposition that the only alternative to naturalism is inexactness or unreason. [. . .] As the only alternative to supernaturalism, obscurantism, irrationalism, agnosticism, mysticism, and subjectivism, – naturalism has acquired a place of intellectual distinction which it does not in fact merit" (Perry 1925: 109).
7 "Naturalist." In *The Oxford English Dictionary*, vol. VII, Oxford 1933, repr. 1961, p. 38.
8 Thompson 1964: 183.

9 Nagel 1954: 7.
10 See for instance Dewey 1944; Dewey et al. 1945; Sheldon 1946; Garnett 1948; Oliver 1949. An overview of mid-century American naturalism is given in an anthology, Krikorian 1944.
11 Sheldon 1945: 254.
12 See Santayana 1925; Dewey 1927.
13 Dewey 1927: 81 and 79.
14 W. Sellars 1979: 2.
15 For an overview, see Schnädelbach 1984.
16 See von Wright 1971; Maninnen/Tuomela 1976.
17 "Die Natur erklären wir, das Seelenleben verstehen wir." Dilthey 1894: 144.
18 Within logical empiricism, the advocates of a unified science did not use the expression "naturalism" to mark their position. Carnap and Neurath talked of "physicalism" and proposed in their 1929 manifesto a general "scientific worldview" (Carnap et al. 1929).
19 Frege 1918: 326.
20 Husserl 2002: 255 (1911: 295–6).
21 Ibid.: 254–8 (1911: 295–8).
22 Ibid.: 257–8 (1911: 298–9)
23 Ibid.: 259 (1911: 300).
24 Ibid.: 259–61 (1911: 300–2).
25 Ibid.: 266–7 (1911: 309).
26 Ibid.: 265 (1911: 307).
27 Ibid.: 276 (1911: 320).
28 Wittgenstein 1953: 232.
29 Husserl 2002: 266 (1911: 308–9).
30 Quine 1969: 76.
31 Husserl 2002: 277 (1911: 321).
32 Wittgenstein 1958: 18.
33 Hacker 1996: 33.
34 Wittgenstein 1953: §281.
35 Kenny 1971: 155.
36 For a wide-ranging, Wittgenstein-inspired critique of the conceptual confusions of neuroscientific theories, see Bennett and Hacker 2003.
37 See for example Wittgenstein 1953: §25.
38 See Wittgenstein's late remarks in *On Certainty* (1969).
39 Strawson 1985: 24.
40 Quine 1969: 26.
41 Quine 1981: 67.
42 Ibid.: 72.
43 Quine 1969: 126.
44 Quine 2000: 411.
45 Quine 1953: 42.
46 Quine 1981: 71.
47 Quine 1953: 45.
48 Quine 1966: 233.
49 See Glock et al. 2003.
50 Quine 1953: 37.
51 Ibid.: 20.
52 Quine 1981: 67 and 21.
53 Quine 1995b: 251–2.
54 Ibid.
55 Ecological naturalism is an exception, for it is based on a distinct concept of nature, namely that of a well-ordered household (*oikos*).
56 Randall 1944: 357.
57 Nagel 1954: 3.

58 Roughley 2004: 48.
59 In two recent texts, for instance, the following kinds of naturalism are distinguished: aposteriorical, cooperative, eliminative, expansive, integrative, metaphysical, methodological, moderate, ontological, radical, reformist, restricted, reductive, revolutionary, scientific, scientist, and unrestricted naturalism (Haack 1993; Koppelberg 1996).
60 "By definition nature is singular and all-inclusive. Unnatural things do not exist." (Schneider 1944: 122)
61 "Now naturalism . . . can be defined negatively as the refusal to take 'nature' or 'the natural' as a term of distinction. . . . For present-day naturalists 'Nature' serves rather as the all-inclusive category, corresponding to the role played by 'Being' in Greek thought, or by 'Reality' for the idealists. In this sense . . . naturalism, in becoming all-inclusive, ceases to be a distinctive 'ism'. It regards as 'natural' whatever man encounters in whatever way" (Randall 1944: 357–8).
62 Armstrong 1983: 82.
63 Armstrong 1997: 5.
64 Ibid.: 6.
65 Harman 1977: 17.
66 Hook 1944: 45.
67 Danto 1967: 448.
68 Armstrong 1997: 7.
69 Thompson 1964: 183.
70 Quine 1995b: 261.
71 W. Sellars 1956: 173.
72 Quine 1992b: 9.
73 Perry (1925: 85) defined naturalism as "the claim that physical science is unqualifiedly and exclusively true."
74 In his two-volume work *Naturalism and Agnosticism* (1899), James Ward criticized naturalism for its alleged infallibilism. He argued from the incomplete success of science, from the hypothetical status of scientific knowledge, and suggested contradictions within the body of scientific findings. In short, he brought to bear the fact of human fallibility against the pretensions of scientific naturalism.
75 Quine 1992b: 9.
76 Quine 1981: 72.
77 Pettit 1993: 214–17.
78 Carnap 1932: 165–6.
79 Ibid.: 166.
80 Ibid.: 197.
81 Wilkes 1978: 18.
82 Quine 1969: 75 and 78.
83 Roughley 2004: 51.
84 Blackburn 1998: 48.
85 See R. W. Sellars 1922; see also Ruse 1995.
86 Ryle comments acidly: "But the influence of the bogy of mechanism has for a century been dwindling because, among other reasons, during this period the biological sciences have established their title of 'sciences'. The Newtonian system is no longer the sole paradigm of natural science. Man need not be degraded to a machine by being denied to be a ghost in a machine. He might, after all, be a sort of animal, namely, a higher mammal. There has yet to be ventured the hazardous leap to the hypothesis that perhaps he is a man" (Ryle 1949: 328).
87 This equation was widespread in the first half of the century: "Naturalism, or the claim that physical science is unqualifiedly and exclusively true, is equivalent to the denial of optimistic religion" (Perry 1925: 85).
88 See Plantinga 1993. For objections to Plantinga's argument see the volume edited by Beilby (2002).
89 Quine 1992b: 9.
90 Quine 1995a: 252.
91 "[H]ere is the irony – both of them [Quine and Descartes] bet on the wrong horse in the scientific sweepstakes of their day: Quine's contributions to psychology and psycholinguistics, in *Word and*

Object and elsewhere, were very much embedded in the Behaviorist tradition, and that tradition, it has become increasingly clear, is not a productive one" (Stich 2001).

92 For a discussion of this phrase of Quine's, see Keil 2003.
93 Sheldon 1945: 263.
94 Randall and Buchler 1942: 183.
95 Fine 1996: 175.
96 Ibid.: 188.
97 Ibid.: 184.
98 Stich 1996: 198.
99 Ibid.: 199.
100 Ibid. Another author claims that scientific naturalism "need not presuppose a solution to the so-called 'demarcation problem' – i.e., the problem of what demarcates genuine science from pseudo-science – as long as there remain clear, paradigmatic cases of successful sciences" (Leiter 2002: 2). I submit that Leiter's appeal to "clear, paradigmatic cases" has all the advantages that theft has over honest labor, if I may borrow a phrase from Russell.
101 Quine, in his later work, defends the hypothetic-deductive method and regards testability of scientific hypotheses by means of observable consequences as a *defining* characteristic of scientificality (see Quine 1992a: 20). Thus Quine would avoid the objection of employing a sociologistic science criterion.
102 Churchland 1981: 75.
103 Dennett 1987: 117.
104 Fodor 1984: 232.
105 Fodor 1987: 97.
106 See for example Tye 1994 and Stich 1996.
107 Stich 1996: 199.
108 Stalnaker 1984: 6.
109 For an overview see Kornblith 1985; Maffie 1990; Kitcher 1992; Rosenberg 1996; Giere 1998.
110 Quine 1969: 82–3.
111 Ibid.: 83.
112 Quine 1975b: 68.
113 Quine 1969: 75.
114 Ibid.: 83.
115 Quine 1974: 1.
116 Quine 1981: 24.
117 "All I am or ever hope to be is due to irritations of my surface"; "our knowledge must depend thus solely on surface irritation" (Quine 1966: 228 and 229).
118 Davidson 1983: 431. Similar objections were brought up by Putnam, Kim, and Rorty.
119 Davidson 1983: 426.
120 Quine 1981: 178.
121 Quine 1975b: 67 and 68.
122 Ibid.: 70.
123 Quine 1969: 126–7.
124 Putnam 1982: 19.
125 See Feldman 2001.
126 Stich 1993: 2.
127 For an overview see Kitcher 1992.
128 Kornblith 1994: 49.
129 See Kitcher 1992: 54.
130 Goldman 1978: 510.
131 "Questions about the actual structure of our concepts are *in principle* as empirical as questions about the actual structure of iron" (Bishop 1992: 269).
132 Kitcher 1992: 74.
133 Roughley 2004: 49.
134 Dretske 1981: xi.

135 Stalnaker 1984: 6.
136 Fodor 1987: 126, cf. 98; Fodor 1984: 232.
137 It should be mentioned that outside of the project of naturalizing intentionality, the broadly Wittgensteinian view has gained ground that definition via necessary or sufficient conditions is neither possible nor necessary to explain the meaning of a concept.
138 Putnam 1992: 57.
139 Baker 1995: 193.
140 Fodor 1987: 126. It is disputed whether there is a reliable linguistic test for Fodor's non-intentional, non-semantical and non-teleological conditions, whether for example semantical intensionality is a criterion for it. In this case, one may ask how intentionality and *modality* are related, for modal claims create intensional contexts as well.
141 Lycan 1991: 264.
142 Searle 1983: 26.
143 Fodor 1990: 52.
144 Churchland 1981: 75.
145 Quine 1960: 221.
146 Putnam 1992: 59.
147 Baker 1995: 208–9.
148 By "changing the subject," I understand with Davidson: "deciding not to accept the criterion of the mental in terms of the vocabulary of the propositional attitudes" (Davidson 1980: 216).
149 For overviews see Hudson 1969; Villanueva 1993; Crisp 1996; Dancy 2000; Copp 2003.
150 Moore 1903: 58.
151 Ibid.: 44.
152 Ibid.: 15.
153 See Hare 1972: 55.
154 Moore 1993: 13. Note the disjunction "natural sciences *or* psychology." In other places (e.g. 1903: 92), Moore chooses a conjunctive formulation, thus counting psychology among the natural sciences.
155 Moore 1903: 41.
156 See Hare 1952: 82.
157 Mackie 1977: 15.
158 Ibid.: 38–42.
159 Foot 2001: 27 and 33. In the philosophy of biology the concept of *function* is often explicated with reference to what is good or beneficial for individual living beings. This view is called "the welfare view of biological function."
160 Ibid.
161 Davidson 1980: 230, cf. 223.
162 Davidson 1982: 292.
163 See Kripke 1982.
164 Wittgenstein 1969: §496.
165 See Laudan 1987.
166 Quine 1992a: 19.
167 Kant [1798] 1974: 3.
168 Kant 1781: B575/A547.
169 Wiggins, McDowell, and other have drawn the parallel between moral facts and values and secondary qualities, which – according to Locke – cannot be defined without reference to human perceptual capacities.
170 Deontic nihilism can be viewed as generalization of moral nihilism. Moral nihilists like Nietzsche, de Sade, and the Sophists accept no moral rules which constrain the right of the stronger or the pleasure principle.
171 Strawson 1985: esp. 1–3, 10–21, 37–42, 51–3.
172 Ibid.: 41. Accordingly, in research on Hume there is a discussion on the relation between Hume's naturalism and his empiricism. With respect to Hume's view on causality, Mounce notes: "What appears in sense experience as constant conjunction is turned by the mind into the form of causality. But the

workings of the mind are instinctive or natural. They are not based on any rational insight into the objective nature of the causal process. On a matter of this importance, nature has not trusted to our fallible reasonings and speculations. . . . It follows that our understanding of the world is based on relations which arise from the workings of nature, not from those of our own understanding" (Mounce 1999: 4).

173 See Strawson 1985: 15 and 41. Strawson also calls the Wittgensteinian view "social naturalism" (ibid.: 24).

174 See Hornsby 1997. Michael Tye has argued in the same vein that the mental is part of the natural world, without indispensably being reducible to anything (Tye 1992).

175 Nussbaum 2001: 366.

176 See my remarks above on cultural and natural facts (in the section "Naturalism with a leading science," pp. 276–71). A further attempt to employ the notion of a "second nature" for a more liberal naturalism stems from John McDowell. According to McDowell, the natural world is "in the space of *logos*," so that even autonomous normative facts about reasons, values, and meanings count as constituents of (second) nature (cf. McDowell 1995). The fact that McDowell labels this view a "naturalism of second nature" only shows the extraordinary prestige of the concept of naturalism, which attempts to mark even naturalistically remote positions with this name.

177 Hook 1961: 195.

178 Danto 1967: 448.

179 Quine 2000: 411.

180 Here is a relevant comment: "It is the argument of this book that though, because social objects are irreducible to . . . natural objects . . . they cannot be studied in the same way as them, they can be studied 'scientifically'." "[I]t is not their similarities with, but precisely their differences from, natural objects that makes scientific knowledge possible" (Bhaskar 1979: 26 and viii).

181 See Fodor 1974.

182 Stump 1992: 457.

183 Quine 1969: 126–7.

184 Quine 1981: 93.

185 Quine 1975a: 95.

186 Quine 1974: 33–4.

187 Quine 1960: 221.

188 Ibid.

189 Quine 1960: 22–3.

190 Danto 1967: 450.

191 "Naturalism, as we have seen, is not science, but an assertion about science. More specifically, it is the assertion that scientific knowledge is final, leaving no room for extra-scientific or philosophical knowledge" (Perry 1925: 63).

192 Schmitt 1995: 344.

193 Bouwsma 1948: 20–1.

194 Quine 1995b: 256–7.

195 Quine 1981: 88.

196 Stich 2001.

197 The chapter was translated from the German original by Philipp Hübl and the translation was revised by Rory Domm.

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