Can Everything Be Rationally Explained Everywhere in the World? Theses and Declarations for Naturalism

Gerhard Vollmer
Technical University of Braunschweig

1. THE BASIS OF DISCUSSION

You can argue about many things: about the meaning of terms, the truth of sentences, the validity of norms and values. But in order to argue at all, you have to agree on some things as well: You need a common language; you have to understand the meaning of assertions, questions, regulations, at least so far as they are important for the discussion; you should know that it is an argument. (Of course not all parties do necessarily *want* this argument; you can also be involved in an argument against your own will.)

Furthermore, for a *meaningful* argument you should agree on what you are arguing about, which means for arguing are allowed and how they can be used. Certain principles of symmetry should be recognized. (If they are complied with, is a different question.) Finally both parties should be able to agree on when an issue is settled.

Certainly you can argue about all that once again: The hierarchy of discussion levels does not have a highest or last level. But the higher you get, the more fundamental the argument gets, and the lesser the points in common.

As scholars we argue foremost about factual issues, secondly about procedural issues as well; but in both cases we assume many things "unquestioned". But as philosophers we examine even and especially such circumstances: We realize them, question them, gather arguments for and against, look for alternatives, define criteria, refer to gaps, circular arguments, contradiction. And certainly we can examine these doings as well. Especially

we inquire about the *conditions* for something being possible, conditions for our talking, asking, concluding, discussing, arguing as well.

The question especially disputed by philosophers is: Which conditions have to be met that perceiving, experiencing, and recognising are possible? In accordance with Kant it is called the *transcendental question*. Kant's question is fruitful, even if his answer is not clear to everybody. But it is extended und applied to other human faculties and activities, especially to scholarly work. What scholars normally assume, in order to be able to work, research and argue, is usually called background assumptions, world view, research leading paradigms, fundamental metaphysical decisions. During scholarly everyday work there is seldom a discussion about them, at best one "philosophizes" about them at the weekend.

In the sense of the division of labour between philosophy and the single disciplines this is absolutely legitimate: Neither on journey nor in the field of research you make progress, if you turn around too often and look back at the starting point. But when you got into a dead end street, it may be useful to return to the starting point, to get your bearings, to change direction, perhaps to choose another starting point. Then many will profit from the fact that philosophers have considered this long ago. In this sense philosophizing is always *thinking in an anticipating manner* as well.

The discussion about naturalism is not an interdisciplinary, but a philosophical one. Admittedly, many scientists are naturalists (in a sense we still have to explain); but most of them are not even familiar with this term, and they would hardly be able to characterize precisely their position or defend it with arguments. Who wants to know if naturalism is tenable, does not go into the laboratory: It is not a question that can be dealt with empirically, even if facts from experience are of—perhaps even crucial—importance.

Now we would like to say as clear as possible what we mean by naturalism. We do this—after a rough characterisation in 2—by formulating and explaining the most important theses of naturalism.

2. TWO IMPORTANT CHARACTERISTICS: UNIVERSALITY AND LIMITATION OF MEANS

We understand naturalism as a natural-philosophical anthropological position. It can be characterized briefly by the thesis: everywhere in the world everything can be explained rationally (*überall in der Welt geht es mit rechten Dingen zu*).[1] According to that, this view distinguishes itself by two characteristics: by its *universal claim* and by the *limitation of means* which are allowed to describe and explain the world.

We are aware that in other contexts „naturalism“ can be understood in different senses, e.g. if one talks about the art of naturalism (above all it is about imitation of nature), or when Charles Darwin entitles his work about his voyage around the world with the “Beagle” *A Naturalist’s Voyage* (it seems that he only wants to be a *researcher in natural-history*), when Karl Popper talks about naturalistic movements in social sciences (as far as they support the *application of physical methods*), or when in ethics the issue of discussion is naturalism (in a sense in which *norms and values* can be found “*out there*” or can be gained from findable facts—what the naturalism explicated here denies).

The mentioned *claim to universality* of naturalism is essential. Even Kant lets himself be called a naturalist “of a special kind” without protest, perhaps even likes it, for he demands that everything in the sciences should be formulated and explained *naturally*—and not in a *theological* language. (Kant 1788, A 126f.) But at the same time he recognizes a *limit* of science: In order to explain organized beings, especially the *expediency* of organismic structures, *teleological* explanations have to be brought in; a grass root Newton is simply impossible. Only when regarding physics, Kant is a naturalist, but not when regarding biology (and not at all when regarding psychology, epistemology, and ethics). In this case modern naturalism is more ambitious: the unmistakable expediency of organismic structures is explained by the principle of natural selection and therefore ultimately by a causally effective principle. Accordingly, a grass root Newton is possible;

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[1] The expression “mit rechten Dingen” is used by Hubert Markl 1983, 75, in order to characterise the attitude of the natural scientist. I first find it as an expression for the naturalistic viewpoint in Winfried Franzen, 1984, 72.

if Charles Darwin has already been the complete Newton or if Gregor Mendel, Ronald Fisher, Julian Huxley, Ernst Mayr, Manfred Eigen and others are needed beforehand, is a question of academic history and—in regard to our problem—of secondary importance. It is crucial that Darwin's theory of selection includes all living beings and therefore biology as a whole within naturalistic explanation, so that teleological explanation becomes dispensable and Thomas Aquinas' or William Paley's teleological proofs of the existence of God lose their persuasiveness. The renunciation of teleology is itself a typical example for the second characteristic of naturalism—the programmatic *limitation of means*. It is not that certain means of description and explanation are prohibited from the outset; it is rather a *principle of economy* according to that the most economical, most simple, and most fundamental hypotheses, theories, models should be preferred among competing, but otherwise equal ones. It is crucial that it is accepted as a principle of selection and as an argument. The before mentioned naturalism's claim to universality certainly goes well with this principle, even if it does not follow compellingly from it.

The expression that everywhere in the world everything can be explained rationally is not very precise. Therefore we want to describe naturalism more exactly, first by presenting its programme. This programme consists of four parts at least[2]:

(1) It demands and draws a *cosmic overall picture*, a "conception of the world".
(2) It also ascribes a certain place in the universe to *man*.
(3) It includes in its claims and approaches for explanation *all* human faculties, language, recognition, academic research, moral action, and aesthetic judgment as well.
(4) On this basis it demands and develops especially a naturalistic anthropology,

[2] For the naturalistic programme see Ernest Nagel, "Naturalism Reconsidered", *Proceedings and Addresses of the American Philosophical Association*, *28*, October 1955, 5-17. Nagel does not speak of a programme, but of an "extensive intellectual image of nature and man"; it includes "a general design for the cosmic events and for man's position within and logic of research".

a naturalistic epistemology,
a naturalistic methodology of research,
a naturalistic ethics,
a naturalistic aesthetics.

Within the context of this programme naturalism holds theses of a sort that regards content and methodology.

3. THESES OF NATURALISM

(i) Only as much metaphysics as necessary!

The opinions about metaphysics differ very much. The traditional philosophy was rather pro-metaphysics. In contrast to that, positivism, instrumentalism, pragmatism, logical empiricism, and the Vienna Circle were extremely anti-metaphysics. But it became obvious that we cannot do without metaphysical assumptions, not even in scholarly studies and science. Therefore naturalism does not reject metaphysics completely, does not think of it as inferior, but tries to differentiate it from empirical science, e.g. by Popper's demand for falsifiability. In any case, differentiating does not mean abolishing, as Popper is sometimes accused of doing.

Then, how much metaphysics should we permit? The naturalistic answer is unambiguous: only as much metaphysics as necessary—necessary for research, for progress of knowledge, for life. Accordingly, the naturalist looks for a sort of minimum-metaphysics (see Wendel 1993, 104). It includes the assumption of a world being independent of consciousness, structured, and related (see iii, viii, ix, xi) and its partial recognisability by perception, experience and an intersubjective science (see iii, viii, ix, xi). This view is also called "hypothetical realism".

Although such metaphysical premises cannot be checked empirically, they are nevertheless open to criticism, e.g. in regard to freedom of contradiction, value of explanation, self-applicability, freedom of arbitrariness, intellectual economy, prolificness. And if they are open to criticism, there can be good reasons for rescinding them and replacing them by others. The naturalist's minimum-metaphysics is put—occasionally— under the microscope of rational critique.

Doubt is here—as with Descartes—deliberation, not an existential mood. Nothing is undeceivable not our own viewpoint, not our minimum metaphysical premises, not even language with which we formulate everything, not even our own questions, our own doubts. But that does not mean that the naturalist leaves everything open. Certainly, the naturalist has convictions, certainties, convincingness; but he is also conscious of their fallibility.

In regarding such a minimum-metaphysics two points can be differentiated: How can it be found? And of what importance is it? It is found by analysis and reflection upon the premises of our thinking and acting. This analysis is a typical philosophical activity. It examines our linguistic usage, performances and mistakes of our perception and our experience, but scientific methods and results as well. The role of our minimum-metaphysics is to guide our thinking and acting. We simply cannot do completely without such epistemological and action guiding assumptions and maxims. The extent of our minimum-metaphysics follows from what we want to know or what we want to do.

(ii) As much realism as possible!

No one can be forced into realism by arguments. Even the most radical solipsist who thinks only his momentary consciousness to be existent is irrefutable. Although his position is not plausible, but it is—when formulated prudently—non-circular and non-contradictory, logically consistent and modest. That is why Schopenhauer compares aptly the solipsist with a maniac in an impregnable log cabin.

But there are good reasons in favour of realism (Vollmer 1993a, 161-181). Certainly they are not of a logical, nor an empirical, nor an historical nature, but of a *meta-theoretical* nature. In contrast to other positions, the realist can answer the following questions in particular. Why do not all our wishes come true? Why don't we succeed in everything we strive for? Because of what do scientific theories fail? (The realist: Because the world is different from what we expect, hope, assume.) Why do independent measuring methods for natural constants produce the same results? Why does it seem that such results approach a limit? Why does usually one theory among competing ones prove to be superior to all the others? (The realist

explains this convergence of research by the uniqueness of the real world examined by us.) Why is our search for invariants, e.g. natural constants, general laws of nature or conservation quantities, so successful? (In particular such invariants are for the realist indications of *objectivity* of insights, i.e., of their connection with reality and their independence of the perceiving subject.)

Now, there are many variants of realism: naïve, critical, hypothetical, scientific, convergent, internal realism. But not all of these variants are tenable. The naïve realism ("The world is how it appears to me.") is already refuted by the possibility of error, in particular by the existence of contradicting perceptions. But also the classical realistic view ("All qualities are or are not connected to the things *unaffected by interaction*, especially by observation.") is called into question by modern quantum physics. If—on the other hand—internal realism ("Real is to what a fictitious (!) conclusive description of the world successfully refers.") is a realism at all, i.e., has sufficient realistic substance, is at least doubtful.

In view of the remaining range of realisms the naturalist opts for as much realism as possible. He is a realist, because he thinks a world without man is possible, but not man (or human mind) without a real world. Space, time, matter and evolution are real to him, independent of consciousness (but perceptible by consciousness). So he opts for as much *objectivity* as possible, but for as much subjectivity as necessary.

It could seem as if this maximum-realism goes unnecessarily far beyond our minimum-metaphysics. But this is not the case: We *need* this realism, in order to *explain* everyday experiences, the course of evolution and of the sciences. Only the person who feels absolutely non need for explanation can relinquish realism.

(iii) The method of empirical science is superior to all others when doing research in the field of nature.

The method of empirical science lives from the interplay between *theory and experience*. For a direct way from immediate experience to theory does not exist, we have to rely on *experiment and elimination of error*. Finally, all means are allowed for experimenting, i.e., to find describing, explaining and predicative hypotheses: intuition, association, analogies, crea-

tive techniques, brainstorming, dreams, visions, speculations. But because error is the rule and truth the exception, the hypotheses must undergo a *strict critique*. As far as possible, they are scrutinized by experience—with observations, measurements, and specific experiments. If then errors are discovered, one will attempt to eliminate them.

This method has turned out to be useful especially in the natural sciences; but—in the way here described—it is also applicable to all empirical sciences. Beyond that each discipline has methodological specifications that it has not in common with other disciplines, for they are tailor-made for its particular research topics.

Because of the great success of specific scientific methods, many tend to transfer them to all other disciplines. Heuristically, such an attempt is completely legitimate; but certainly it is not guaranteed that those methods can be applied universally. In this case as well—regarding methodological questions—one will learn from successful and unsuccessful experiments; in this sense the process of experiment and elimination of error is *self-applicable*.

Occasionally, naturalism is characterised by the demand that everywhere scientific methods should be applied *exclusively*. Obviously, such a *scientism* would be quite dogmatic. It would contradict the principles of critical rationalism. But naturalism as well is not tied nor has to rely on such an imperialistic attitude; perhaps it is the premise, but not the result of the scientific method, even if these results proved it to be true and so support it. In particular the *premises* of one's own action, especially that of scientists, are not found in the laboratory or by an experiment or observation. Constant analysing, critical reflection of one's own premises—of a metaphysical, methodological or moral nature—thinking in an anticipating manner in this meta-theoretical sense is not a matter of singular disciplines, but of philosophy. (That does not exclude that scientists of singular disciplines philosophise occasionally—and perhaps very successfully.)

The crucial criterion for philosophical, especially meta-theoretical positions is not their empirical verifiability (or falsifiability), but their *criticisability*. For the empirical examination of factual statements presents a particularly strict way of critique, it will be used where it really can be applied. In cases where it cannot be applied, other methods will be used as well. The superiority of the empirical method is due to the exactness of its

critical instruments; but this exactness does not establish a claim to exclusiveness.

Even if everything what is belongs to *nature* for the naturalist, man, thinking, knowledge, moral and aesthetic feeling and judgement as well, he does not take everything to be a research topic of *natural science*. This seeming paradox is based on the fact that the term 'nature' alone has another meaning as in the combination 'natural science'. Although field of natural sciences has been extended considerably by ethology, neurobiology, and a philosophy orientated towards natural science and furthermore many clear-cut borderlines have vanished, it will not be assumed that all empirical sciences, humanities and social sciences as well, have turned into natural sciences. Not only natural sciences have nature in the sense of naturalism as a topic—and this will never be the case.

But in a *hierarchy* of academic undertakings natural sciences are at the bottom and physics is the basis. It is clear for everyone that such a hierarchy exists at all. But the naturalist furthermore tries to use methods and results of lower levels of the hierarchy for a better understanding of higher ones. The question of the lowest level leads us to the next step.

(iv) Nature (world, cosmos, universe, the real) is primarily materially energetic—in temporal and causal respects as well.

An alternative (which naturalism denies) would be the assumption that the world is primarily spiritual. Between the alternative materialism–spiritualism the naturalist tends to materialism, even though not to each of its forms. The classical materialism in particular starts from the assumption that all that is real is *material*. But with Clark Maxwell physics has managed to come to realize that it makes sense to ascribe reality to *fields*, waves, and rays. If one speaks of particles at all (e.g. light particles, light quanta, photons), it concerns particles without rest mass. Such systems are not characterised by their mass, but by their energy. For that reason we use the more complex expression 'matter-energy'.

The existence of spiritual, especially mental phenomena (conditions and processes) is denied by no means. But they are held as conditions and processes of real, i.e., material-energetic systems, especially of central nervous systems of a sufficient complexity. Consequently, incorporeal

mental conditions and processes do not exist. (It could be expedient to *talk as if* such incorporeal mental phenomena existed, if the material substratum is of no importance for the problem in question.)

To speak of a *primacy* of matter-energy over other "things", especially over the mental (or the spiritual), means two things: Firstly, material-energetic systems *can* exist without mental characteristics. Secondly, mental phenomena *do not* exist without a material-energetic basis. With the observation that systems without mental characteristics *in fact* have existed we proceed to the next thesis.

(v) All real systems—the universe as a whole included—are subject to development, evolution, increase and decrease, rise and fall.

Modern naturalism is thus an *evolutionary naturalism*.[3] Each development can have a beginning and an end; it can—according to standards which have to be defined—go upwards or downwards. It could stagnate for some time as well; but this hardly occurs in our universe.

It is also imaginable as well that the cosmic evolution we are observing (and of which we are an interim result) is only a part of a huge *cycle* that leads back to its starting point. Our universe could—in the sense of an eternal return—go through many, perhaps an infinite number of similar or identical cycles. But there is no reason to say that this is true: We nearly do not know anything—assuming that these expressions make sense—about the time before the big bang and about the time after the (possible) final bang, the same applies to the existence, number and sort of such cycles.

Today the keyword 'evolution' is often used, almost inflationary. This extensive use leads easily to a haziness of definition, ambiguities, misuse. Occasionally 'evolution' means only *biological* evolution, then "only" biological relations, the origin of organismic species out of others, phylogenetic trees, and the factors and laws of species development are concerned. The origin of life—the biogenesis—need not be mentioned yet, not even the origin of man—the anthropogenesis. Even Darwin does not treat the

[3] Thus the title of an unfortunately unrecognised book: Roy Wood Sellars, *Evolutionary Naturalism*, Chicago: Open Court 1922.

origin of life or of man in his major work *On the Origin of Species*. Also later he did not think that the time was ripe for a theory of biogenesis. His book *The Descent of Man* was published not until 1871; at this point many of his thoughts had already been anticipated by others.

But it is obvious to examine the applicability of the evolutionary idea to other systems and to extend the definition and the theory of evolution "downwards" and "upwards" as well. In our century natural and social sciences have been very successful with this attempt; it is quite right to speak of a *universal evolution* and of an evolutionary *paradigm* in an extended sense. The accuracy of concepts and laws of the biological theory of evolution has to be examined in any case, i.e., for each system and each phase of cosmic evolution, but it is not a matter of course.

Theories of self-organisation try to show more exactly—and that is their function—what characterises evolutionary processes in particular, what different evolutionary phases have in common, and what distinguishes them. The concept 'self-organisation' incorporates obviously the claim to explain the formation of complex structures and patterns "from below". So these are further steps in order to realize the naturalistic programme.

As it was expected, the downward extension of the evolutionary paradigm was easier than the upward extension. Although the origin of *life* is nowhere near being clarified, understood, and explained; but there is a wide agreement that it could happen and in fact did happen on earth and "automatically", i.e., according to the then—four billion years ago—prevailing conditions and to the laws of nature known to us, that it happened according to the naturalistic sense (*mit rechten Dingen*). The evolutionary origin of *man* as well as one among many biological species is generally acknowledged, even if unfortunately many details are unknown or unclear—regarding our enormous "personal" interest.

But it is different with the higher human faculties: Recognition, language, moral behaviour, and aesthetic judgment. In theses cases many different positions stand opposed to each other incompatibly. According to the naturalistic view the evolutionary paradigm or the explanatory approach "from below" is here not only possible and reasonable, but also successful. Ethology, socio-biology, neuro-biology, bio- and psycholinguistics, artificial intelligence, and other disciplines bring up research results for this. These results have an impact on those philosophical disci-

plines that traditionally deal with typically human faculties: anthropology, epistemology, philosophy of language, moral philosophy, ethics, and aesthetic.

The evolutionary idea combines many academic disciplines: By suggesting that the development of different systems should be seen or classified as parts or phases of a *universal* evolution, it contributes to the unity of science (see Vollmer 1989, 41-65 and Vollmer 1995a, 59-91).

(vi) Complex systems consists of and develop from simpler subsystems.

Evolution did not start with complex systems or a particularly complex 'super-system' that gradually decay now and lose more and more characteristics. (This idea was held for a while in regard to living creatures.) It is exactly vice versa: complex systems develop later on and have characteristics that none of the subsystems ever had. We call this appearance of new characteristics of systems *emergence* (Vollmer 1992, 183-223).[4]

If complex systems *originate* form simple ones, then it is obvious to attempt to *explain* the emergent characteristics from those of the subsystems, to *derive* the former ones from or to *reduce* them to the latter. For the naturalist who assumes the *ontic* emergence the *evolutionary argument* is most convincing argument in favour of an *epistemic* reductionism.[5] This strategy was successful, but not in all fields; that is the reason why the hindrances deserve special attention. Thus, the naturalist is near to reductionism without being bound to it indissolubly.

Can real systems be divided infinitely or does a limit of divisibility exist? There will never be a final answer to this question; for we cannot find out, if our inability to divide elementary particles any further is a matter of

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[4] There it is discussed in detail that 'emergence' *can* be explicated in a different way; that some include especially the *non-explicability* of new characteristics "from below" as a defining feature—but we think this is awkward.

[5] Regarding the evolutionary argument, see Vollmer, G.: "Die Einheit der Wissenschaft in evolutionärer Perspektive." In: Vollmer, G. (ed.) *Was können wir wissen?* Band 2: Die Erkenntnis der Natur. Stuttgart: Hirzel 1986, ^{3}2003, 163-199, in particular 185-189.

principle or has only practical reasons. But at the moment there is no objection to see quarks and leptons as unstructured and punctiform and so as indivisible.

(vii) The real world is connected and quasi-continuous.

One can talk about continuity in many respects. First of all, *space* and *time* are continuous parameters that have turned out to be very useful in describing the world. The real systems we know of are interrelated, too. The reason why we do not find any completely isolated systems is not surprising at all; for they could not interact with us as observers, not even indirectly, so that we simply cannot know anything of them. Thus, one can safely assume or deny the existence of isolated objects; in none of the cases a refutation need be feared. For economical reasons the naturalist assumes a world that is connected in regard to space and time.

But the *processes* which we deal with could also proceed in an abrupt manner. In fact it seems at first glance that many discontinuities exist: quantum leaps, mutations, phase transitions, experiences of conversion, catastrophes, revolutions. In most cases it is only the resolution that matters with which a process is observed. When viewed more closely, supposedly abrupt processes prove to be more than averagely rapid, but steady as well. But it seems that this does not apply to quantum occurrences. They introduce an unsteady element in our world; with regard to that the naturalist speaks of quasi-continuity.

(viii) Authorities that are beyond human experience are imaginable, but they are dispensable for the observation, description, explanation and interpretation of the world.

Examples for such authorities, levels, beings, powers are to be found in many myths, religions, esoteric doctrines, para-and pseudo-sciences. The existence of such transcendent authorities cannot be refuted. But that does not mean that they exist (just as their unprovability does not imply their not existing).

Does that mean that the question of existence has to be left open? Again it is—as in g—the economical principle that breaks up the symmetry: The

naturalist assumes that such authorities do not exist. Thus, he is—especially with regard to the existence of a personal god—an agnostic, or even an atheist (Vollmer 1993b, 16-31 and Vollmer 1995b, 168-184). The same applies to an afterlife.

But why should we follow such an economical or simple principle? Many academics, particularly Albert Einstein or Paul A.M. Dirac, give *aesthetical* reasons and like to talk of the *elegance*, even of the *beauty* of an economical theory. The preference for simple hypotheses to complex ones is not only a question of liking. Especially Popper stresses that *methodological* reasons as well suggest such a choice: The simpler of two hypotheses is also the one that can be more easily perused (Popper calls it: falsifiable[6]); if it is false, it is easier to be recognized as false and therefore faster to be exchanged by another. Therefore the naturalist is *firstly* a monist, atheist, determinist, physicalist, or reductionist until good arguments show that such positions are *too* simple. *Imaginable* arguments of this kind are given in the following paragraphs.

(ix) Miracles do not exist.

What are miracles? There are two different answers to this question. It is normal to define miracles as events that infringe on the laws of nature. In this case laws of nature are regularities in the reaction of real systems. But if not all systems react in that way, as the supposed law of nature predicts, then it is *not* a strict regularity and therefore it is not a law of nature. According to that explication miracles are excluded by definition. Then the assumption that miracles do not exist is true, but only analytically.

But we understand intuitively statements about the possibility or the reality of miracles as *synthetic* statements which are true or false, not only because of linguistic reasons. Therefore we define miracles as events that break through the strict cosmic order by the presence of an extramundane authority.[7] Thus, *four* elements are crucial for this definition of miracle:

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[6] Karl Popper proposes to equate simplicity with the degree of falsifiability in *Logik der Forschung* (1934), Tübingen: Mohr [9]1989, section 43.

[7] See Gordon Stein (ed.), *The encyclopedia of unbelief.* Buffalo: Prometheus 1985, entry “Miracles”.

(1) The existence of a cosmic *order*.
(2) The *infringement* of the latter.
(3) The *rarity*, the exceptional character of such infringements.
(4) The active participation of an *extramundane* authority.

One could assume that the former held non-existence of transcendent powers excludes automatically miracles. But that is not quite right. Extramundane authorities could be experienced by the fact that they perform miracles perceptibly; then they would not be beyond all experience and transcendent in a strict sense.

The naturalist denies both: the existence of transcendent authorities *and* the occasional intervention of extramundane authorities in natural events. A convincing proof of miracles would refute naturalism effectively.

The fact that a naturalist rejects miracles does not mean that he would not be willing to wonder or admire natural occurrences because of their beauty, complication, functionalism. Wonderment is not only for Plato and Aristotle the beginning of philosophy and science, but also for the naturalist a valuable and typically human faculty. Natural explanation does not exclude natural experience, and rationality does not exclude emotionality.

(x) An extrasensory perception does not exist.

There might be many things that we have not discovered yet. Other channels of information unknown until now are imaginable. But for them there will be also sensory organs and measuring instruments (that have to be discovered or invented, too). But a *transmission of information without a transmission of energy* does not exist; and one can even say what minimum-energy is needed in order to transmit one bit of information in our universe (Sachsse 1971, chap. 2.4).

The naturalist faces most assumptions of parapsychology very sceptically. As far as these phenomena (which are assumed as clairvoyance, telepathy, precognition, manifestation, telekinesis, or paraphysics) are well proven at all, the naturalist will look for physical, also material-energetic powers, interactions, fields, channels of information. It does not seem that there are well proven para-phenomena up to now, even if many observations still puzzle us.

In view of unusual and unexplained phenomena, the naturalist thinks it better to take advantage of *known* laws of nature in a persistent manner. Should he fail nonetheless, so he is indeed willing to consider gaps and errors in our knowledge of nature and to look for better explanations and for *new* laws of nature as well. Scientific revolutions are in fact characterised by reconsidering even central assumptions of our theories. But a recourse to transcendence, esotericism, the extramundane, or the unnatural seems to be for the naturalist a declaration of failure. Certainly we cannot and do not have to explain everything; but *if* we want to explain, *then* the naturalist demands emphatically a restriction to natural, real, material-energetic structures. But a convincing proof of extrasensory phenomena would force the naturalist into a revision.

(xi) Even the understanding of nature does not go beyond nature.

Understanding only succeeds by the means of our brain, i.e., a natural organ. But that such an understanding *has to* succeed is not certain; for the human brain is in the first instance only an organ for survival and therefore need not be able to recognize the world. But that an understanding *could not* succeed, has not been proved as well. Although the brain was evolutionally tested in our cognitive niche, the meso-cosmos, we have left already this meso-cosmos by the means of language and therefore we are only subjected to a few fundamental restrictions.
A naturalistic interpretation of human understanding has to assume a naturalistic solution of the problem of body and soul. Such a solution which would satisfy every position does not exist up to now. Especially concepts as meaning, intentionality, qualitative feelings ("qualia") show some difficulties (see, e.g. Strawson 1985, Papineau 1993, Keil 1993). Regarding this question naturalism is still on the *programme*.

(xii) There is a unity of nature which could be reflected in a unity of science.

We have already used the idea of a *unity of nature* for some of the present theses, e.g. the primacy of the material-energetic (d), the world's character of relation (g), the rejection of transcend authorities (h). Carl Friedrich von

Weizsäcker who is—as Kant—only partly naturalist characterises his idea of the unity of nature by five presumptions (von Weizäcker 1971, 466-470):

(1) Unity of laws: A single fundamental theory applies to the whole of nature (for von Weizsäcker it is the quantum theory).
(2) Unity of objects: All natural objects consist of elementary particles that are divided only into a few classes (see iv, vi).
(3) Allness of objects: The world as a whole can be seen as one single object.
(4) Unity of experience: All experiences can be embedded in a unified space-time.
(5) Unity of man and nature: Man as a perceiving subject is a part of nature with a genetic continuity with animals and finally with inanimate systems as well (see v, vii, xi).

Obviously, von Weizsäcker does not even try to separate unity of nature from unity of science. This is regrettable; for they can be differentiated easily. Thus, it is imaginable that the idea of a unity of nature proves to be successful, but a unity of science is not achieved because of rather pragmatic reasons.

For the naturalist, the idea of the unity of nature points the way ahead. But it can be filled in different ways. A "final" formulation of this idea rather does not exist.

4. WHAT IS INDISPENSABLE FOR NATURALISM?

All these theses are meant to be *working hypotheses* that are criticisable and correctable on their part. Some of them are at least indirectly perusable; e.g. thesis d would be refuted, if forces without a material-energetic carrier were be detected, if live forms without a material basis existed, or if psychological processes without a neural (or another comparably complex material-energetic) substratum existed. Although the non-existence of such carriers cannot be proven, it can be demonstrated with much plausibility. Thus, successes and failures of natural research are in particular crucial for

a change of position. In fact one would be inclined in the past to characterise naturalism by a strict demand of continuity, e.g. the Leibnizian *Natura non facit saltus*. But in view of modern physics this demand was untenable. (It was nevertheless indirectly perusable, namely by the success of fundamental physical theories and their interpretations.)

The naturalist is thus willing to reconsider his demands and to change or amplify them if necessary. Accordingly, he is methodologically near critical rationalism. (But that does not mean that all critical rationalists are or have to be naturalists; e.g. Popper is not a naturalist—as his three world theory shows clearly.)

Certainly, the naturalist cannot move away from each of his theses as far as he wants to. As every conception of the world the naturalistic one has indispensable elements: they cannot be given up without the surrender of naturalism as a whole. This is not dogmatic, but a question of clear definition: It is certainly possible—if required—to *leave* the naturalistic position at one's own or somebody else's wish or without a motive; but not any position is *called* 'naturalism'. Probably, the following programmatic demands are indispensable:

(1) Only as much metaphysics as necessary! (i)
(2) A minimum realism according to that a world without man is possible. (A weak version of ii)
(3) Primacy of inanimate matter-energy (iv)
(4) The construction of real systems from simple particles (v)
(5) No transcendent authorities related to experience (viii)
(6) Therefore no miracles (ix)
(7) The mental faculties of man do not go beyond nature. (xi)

Naturalism is—as seen—still on the *programme* in regard to many issues. The confidence that naturalist have in this programme is not so much based on proofs—which hardly exist—as on economical principles, on the leading role in research of naturalistic theses, and on the successes. These bases are so fundamental that it is not easy for the anti-naturalist to deprive them of their supporting power. At the same time they show how one can argue against naturalism: one objects to economical principles (with good reasons); one shows that anti-naturalistic premises are—at least occasion-

ally—heuristically more fruitful than naturalistic ones; one does not accept actual or presumable success as an argument or denies effectively the success of the naturalistic approach. It should be scrutinized if anti-naturalistic arguments can be systematized sensibly according to that division; but of course such a scrutiny cannot be done here.

5. WHY AM I A NATURALIST?

This chapter is more personal than the previous ones. The editor has explicitly asked me to do this. There are less arguments than confessions. I think confessions are acceptable, but philosophy cannot restrict itself to it. Therefore the actual problem is not to make confessions not to suppress them, but to mark them as such, as they appear. ('Confessions' do not necessarily mean confessions of faith. I will deal with that later on.)

To characterise a position is one thing, to take up one another. I am a naturalist in the sense I have described in the previous chapters. Certainly, this attempt is based on my desire to make it clear for myself what I really mean and which philosophical "pigeon-hole" I am part of.

One can have an attitude, a belief, a conviction without thinking about the reason why. That is even the rule rather than the exception. But philosophers do reconsider; same even think that this is the main task of philosophy. Thus, one can also analyse one's own attitude: biographically, critically, by arguments. One can even ask why one is inclined to analyse things, i.e., the act of asking is employed on oneself. Then the asking will not end.

Why am I a naturalist then? I have not always been one. How and why did I become one? There is no definite moment in which it happened, no crucial experience. It was a gradual process. Often I only recognized afterwards that I did not want or was not able to agree on this or that any longer.

Naturalism as I understand it has many facets: ontological, methodological, semantic. In regard to religious questions naturalists are agnostics or atheists. Now I will report especially on the religious side.

I grew up as a Protestant. At home we said our prayers, I was baptized and confirmed, went to religious education and to church, participated in the Protestant parish youth for years, was myself leader of a youth group

and went to seminars of the Protestant Academy. Our pastor gave me a bilingual New Testament; he said I should study theology and become a curate. I was even married in church.

But I always had problems with religious *contents*. To take the bible as god's word seemed unreasonable to me. I did not like when someone answered a question with a biblical saying. I was startled as I learnt how little was known historically about the person called Jesus. Miracles already seemed implausible to me at an early stage. The problem of theodicy not only seemed unsolved to me, but insoluble. The maxim of some church scholars "Credo quia absurdum" seemed absurd to me. How should one tell the difference between absurd statements which one should believe and absurd statements which one should not believe? There was more of such doubts.

My natural scientific studies have contributed very much. The results and the methods of science as well were of importance. Science contradicts many theological statements. And it has developed methods for problem solving that are very different form the methods of theology. But the statement that results and methods are *different* does not provide a decision which results are correct and which methods are appropriate. What should or what can be done in such a case? Here philosophy comes into it.

During my philosophical studies religious or religious-philosophical questions were of no importance (anymore). Nonetheless it was effective, because I learnt and realized how important it is to be *consistent*. There are many—also and especially many scientists—that deem others things to be true on Sundays than on weekdays. It may be that one is able to see scientific and religious truths as two sides of the same reality, as "perspective", "dual", or "complementary". I do not succeed in doing this; I cannot overlook contradictions in that way.

Of course, one can attempt to avoid such contradictions. One could limit theological statements to such ones that do not ascertain claims to truth. This has been proposed occasionally; but it is obviously not that way that theology wants to take. Also one can limit oneself to fields that are not open to experience, especially to scientific experience. But how is its truth made plausible then?

It seems to me that one cannot avoid the contradictions. Accordingly, a competition between scientific and religious statements is created. And

science has developed a huge apparatus in order to eliminate such contradictions. Philosophy of science has scrutinized and extended this apparatus. As a philosopher of science I am inclined to use this tool for the competition of science and religion. It is demonstrated that many theological statements are not perusable or do not pass the examination.

But it is not the case that philosophy of science has turned me into a naturalist. I had my doubts already at an earlier stage. But it has given me the means to handle those doubts, to state them more precisely, to provide them with arguments, to substantiate them.

And still later I came to know the expression 'naturalism' for my position. Before I had only the term 'materialism' at my disposal. But it is not very apposite. Firstly, it only shows the ontological side, i.e., the material structure of the world. Secondly, this materialism has changed, even revised itself: Long since materialists accept that the world does not only consist of matter, but also of fields and energy, therefore we talk more precisely of a material-energetic structure of the world. Thirdly, many people assume that a materialist only thinks of the "material", it is all about—in simple words—money. But in this sense a materialist can be quite an idealist. Fourthly, 'materialism' implied easily dialectical and historical materialism then, and that seemed to me—in spite of much agreement—quite misleading. The term 'naturalism' came just at the right time for me; now I had a name or my position.

Should one spread one's attitude? Should one promote it? Should one attempt to convince others? In regard to this question I have a dual, but hopefully clear answer: If I am *asked*, then I advocate my view. Faust's answer to the Gretchen question "How do you feel about religion?" is—because of understandable reasons—unclear, evasive, cowardly. Faust hides the fact that he does not think the same way as Gretchen does. His god is abstract and impersonal, Gretchen's god is concrete and personal.

But I do not feel the need to convert others; *I do not do missionary work*. This attempt has already caused much disaster in world history. I am a *fallibilist*. We always make mistakes, and it may be possible that I am wrong. The fallibilist is modest: Although he has an opinion, perhaps even a strong conviction, he takes the fallibility of everyone, his own as well, into account. Perhaps he thinks that he knows what others lack; but he is

not sure about this and therefore he will not make a person do what is good for that person or even try to persuade that person.

Hardly anybody has held fallibilism more consistently than Karl Raimund Popper. He has formulated it again and again, has talked of tolerance and intellectual modesty, has recommended it strongly. But two problems remained unsolved, a theoretical and a practical one.

The *theoretical* problem is included in the question how tolerant one should or must be towards enemies of tolerance. If one is too tolerant, so it will be used, oppressed, eliminated. Therefore Popper decides in favour of the motto: "No tolerance towards the enemies of tolerance!" But this strategy is not consistent: Tolerance is undermined. In particular this strategy makes the limits unrecognizable: Given as the pretext that a person rides roughshod over tolerance, one can fight him—and consequently everybody—and that in the name of tolerance! For this problem I have no real solution.

The *practical* problem consists of the fact that—although Popper taught tolerance—he could be very intolerant as a person. I experienced that repeatedly, and many of his students, even and especially his best, suffered. He created some of his worst enemies because of that. One can excuse Popper by saying that he was not only a wise man, but also a passionate one. But the contradiction between theory and life remains—a contradiction that is called elegantly a *pragmatic* or *performative inconsistency*: One acts in another way than that one recommends. This does no harm to the legitimacy of a theory, but to its persuasiveness.

If it is true that Rousseau who has written with "Emile" a novel about education put his own children into an orphanage, then he is also guilty of such a pragmatic inconsistency. (But it is suspected that Rousseau did not really do this, but simply wanted to attract attention with this confession. But then he was not honest, and presumably this contradicts his educational ideals, too.)

Socrates taught that laws have to be obeyed, even if one thinks them unjust. According to that theory he refuses to escape in order to evade execution. Perhaps therefore he is regarded by some as the most important philosopher: He even died for his belief.

So I do not expect that all human beings, all colleagues, or all friends are or become naturalists. Of course it is agreeable to find that others share

the same opinion. Then you are spared of discussions, explanations, debates. But this is not crucial. The willingness to debate without polemics or disparagement is crucial. It is crucial that you tolerate each other.

Regarding this the fallibilist has it easy. Fallibilism is not a confession of faith. The fallibilist is willing, well, let's say should be willing to expose all views—and all confessions—to criticism: naturalism, realism, critical realism and even fallibilism as its basis. This position that also regards the critical rationalism as provisional and correctable is called *pancritical rationalism* by William Bartley (see Vollmer 1993a, 6ff. and 152f.). He is more consistent as Popper himself. Because I estimate such consistencies, I am a pancritical rationalist.

Can one be both, a naturalist and a pancritical rationalist? Or is it a contradiction, perhaps a pleonasm? I think that is not the case. Naturalism is an extensive *philosophical* position (everywhere in the world everything can be explained rationally—*überall in der Welt geht es mit rechten Dingen zu*) that is characterised by its universal claim and its demand for limitation of means. The (pan)critical rationalism is here regarded as a *methodological* position. An overlapping exists only in so far as naturalism has itself methodological elements or entails them. Essentially, the methodological tools of naturalism are that of critical naturalism. (A conversion is not allowed: Not each critical rationalist is already a naturalist. Thus, I would not call Popper a naturalist, especially regarding his three world theory and his attitude towards the problem of body and soul.)

So one can be a pancritical rationalist *and* a naturalist. And this I am consequently.

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