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ON THE PROBLEM OF REDUCING SEMANTICS TO FORMAL RULES IN ANALYTIC PHILOSOPHY

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Abstract. The sciences, including social sciences and the humanities, are institutions in which we develop and control general knowledge as the material content in our semantic systems – which we presuppose and use in assertions and other speech acts. Dialectical reason consists in free judgements that take possible exceptions of generic truths in empirical applications into account. All content rests on equivalence relations in perspectival change and is, therefore, not finer, but coarser than qualitative distinctions and syntactic forms in particular languages.

Keywords: generic knowledge, default inference, pure domains, formal logic

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Научная статья

О ПРОБЛЕМЕ СВЕДЕНИЯ СЕМАНТИКИ К ФОРМАЛЬНЫМ ПРАВИЛАМ В АНАЛИТИЧЕСКОЙ ФИЛОСОФИИ

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Аннотация. Науки, включая социальные и гуманитарные, – это институты, в которых мы развиваем и контролируем общее знание, понятое как материальное содержание в наших семантических системах, которое мы предпосылаем и используем в утверждениях и других речевых актах. Диалектический разум состоит в свободных актах суждения, которые принимают во внимание возможные исключения из генерических истин в их эмпирических применениях. Все содержание покоится на отношении эквивалентности в изменении перспектив и тем самым не является более точным, но скорее более грубым, чем качественные различия и синтаксические формы в конкретных языках.

Ключевые слова: генерическое знание, стандартный вывод, чистые области, формальная логика

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1. There is no immediate correspondence between verbalized knowledge and the world

The statements that function in this text as section-titles are no claims that one has to prove, but articulate important truisms. The task of philosophy is to make truisms explicit, the task of the sciences is to argue for specific theories or models

as good means for representing certain domains of the empirical world. Most so-called arguments in philosophy thus turn into giving reasons for a specific way of *commenting* on well-known practices or facts. If they are successful, the comments can *show* us why a certain form of speaking can be helpful for better understanding. In a way, the situation of philosophers is, therefore, similar to that of art-critics. They do not at all compete with what they comment, even though there are cases, in which their commentaries can help us to see things and matters in a “clearer” light, for example when we learn to put them into the right context.

It was an important insight developed by Kant and Hegel, re-discovered by the young Wittgenstein, that the world as we refer to it is not structured *per se* – which means here: without reference to *our* conceptual *representations* of the world. However, there are important differences between talking about *my world*, *our world* and *the world*. We therefore should have problems with Wittgenstein’s aphorisms in the *Tractatus*, especially where he says that I am my world and that the world is my world¹.

The structured world to which we refer in our world-related knowledge is, however, indeed always already formed by our system of concepts, which Hegel addresses in short, generically, as “the concept”. Concepts are, as Plato already knew, ideal forms. We purposefully articulate such forms in so-called theories. I propose to understand theories as systems of sentences or structured propositions. We use them in talking about the world by saying that this or that is an instance or manifestation of this or that generic form or structure.

A purely mathematical structure comes into being through our symbolic constructions and idealizations, which lead to time-general standing sentences expressing generic knowledge about perfect forms. A paradigm case is geometry as the system of ideal *forms of rectangular solids* that we can (re-)produce like bricks in different, but by far not arbitrary, sizes and exactitudes². Before Einstein, no-one had realized that Euclidian geometry, if applied to the space of relatively moved bodies, is just an *analogy*: Outside the so-called point-space of Euclidean mathematical geometry, there is no infinite “rectangular” space at all. There are no straight lines and no flat planes in “real space”. This is the true content of the ominous, dark and misleading, statement that real space is not Euclidean. However, real space is also not exactly of the form of Einstein’s General Relativity Model, even though it makes ingenious use of *Tensor Analysis* developed by Carl Friedrich Gauss and Bernhard Riemann, taking Minkowski’s model for Simple Relativity Theory as its basis³.

Using analogical models in concrete cases is always mediated by a projective use, just as any use of a metaphor or other figurative forms of speech. Therefore, we have to distinguish between the *sentences* that we set as formally true *in* a theoretic model, on the one hand, and their *applications* in empirical contexts and concrete *speech acts*, on the other hand.

In the *Tractatus*, Wittgenstein does not distinguish (enough) between language and speech (*parole*), i.e. between (words or) *sentences* and *assertions* about present

¹ Ludwig Wittgenstein says in the *Tractatus Logico-Philosophicus* (= TLP) [1] Nr. 5.62 “that the world is my world”, TLP 5.63: “I am my world”, TLP 5.621: “The world and the (= our) life are the same”, but TLP 1: “The world is all what is the case”.

² Cf. [2. P. 92f].

³ Cf. [2. P. 283f and 359f].

or past affairs¹, even though he distinguishes between the sentence as an expression (sentence-sign, *Satzzeichen*)² and the “structured proposition” (called “sentence”) expressed by it. The main problem is not so much the vague ambivalence in talking about the logical “deep structure” of normal language sentences, but the following fact: Bertrand Russell and the whole tradition of analytic philosophy systematically overlook the crucial fact that *we can never abstract from the speaker, time and place in empirical propositions*. “Empirical” should always mean, indeed, that we deal with assertions or narrative stories about *this* or *that*.

If we thus understand the word “empirical”, empirical reference to the world presupposes: (1) a reference to a place and situation *here and now* or *then and there*, relative to a real or imagined speaker, (2) an *instantiation* of a *genus*, *manifestation* of a *species* or *token* of a *type* at this “place in space and time”, as we say – depending on (3) a corresponding context of speech that determines the subject matter to which we (want to) refer.

It is a deep illusion to think that we could get rid of these dependencies from context and subjective perspectives in empirical assertions. Replacing, for example, deictic pronouns by definite descriptions does not help much in the domain of empirical matters: They just presuppose silently some spatial and chronological places as “zero-points” of reference – together with an explicit characterization of the conceptual type of the empirical instance. Even though a definite description in the empirical realm like, for example, a date like 1.1.1900 AD and a place like the centre of St Peter’s Square is indeed “more objective” than a deictic reference “here and now”, this is only due to a corresponding practice of changing perspectives. We go, so to speak, from today via the conventional birth of Christ to 1900 and we imagine some travel from here to Rome. In other words, descriptions of the time and space of historical objects or events are definite only in relation to our time and place, whatever we take as “zero-points”, Jerusalem or Rome, the birth of Christ or the mythical founding of the city of Rome.

It is a non-trivial truism that, in empirical reality, there is only one way of *changing perspectives*, namely by moving to other places. There is no travel into the past and the future; and there is no way of looking into the heads of other persons. This makes the use of *generic knowledge about types of things and events* so essential when we try to talk about objective matters: We can jointly refer to them *only* as *instantiations of generic types* – and place them into a space-time-order of other empirical manifestations of things and matters. In a sense, Kant came already quite near to this insight.

For perspectival changes and object-related references, *we already must master the practical semantic forms of projecting* generic knowledge about types of things and processes onto “our experience”. In this way, generic models give structure to our world and make objectivity possible. This is the reason why children acquire *generic* knowledge in the phase of learning a first language *before* they (can) speak about *particular* properties of *singular* items.

These are very deep general truths. They show how metaphorical the thesis of a so-called isomorphism between the world and the linguistic representation of the world is, as we find it illustrated in Wittgenstein’s sketches of gnomic oracles in

¹ [1. TLP 2–TLP 2.014].

² [1. TLP 3.12–TLP 3.2].

the nevertheless deservedly famous *Tractatus*¹. However, there is a whole manifold of structures hidden in the very notion of “sentence” as Wittgenstein uses the word – just as in the concept of *Konstantierung* (i.e. *empirical assertion*) from Moritz Schlick to Wilfrid Sellars.

Careless thinkers are regularly seduced into the thesis of a plurality of worlds or even of an incommensurability of world pictures. The unity of the world as real reality (*Wirklichkeit*) is *not* determined by a *single world-model*. The later Wittgenstein approaches this insight by recognising the purpose-dependence of our always merely local models of the world. There is not only one theory of the world, not only one ‘true’ world view; rather, we work with local structures that can be *complementary* to each other – precisely in the way that Niels Bohr recognises, or at least suspects, as the basic form of the various forms of physical world modelling.

It is, however, not easy to cope with this locality of all our representations and explanations of the world. The same holds for the dependency of empirical assertions on a priori generic knowledge – and on a concrete set of relevant aspects. When we say that there is milk in the fridge, for example, we assume a priori that it is fresh cow-milk, not poisonous, etc. We cannot check all these normal dispositional properties of milk just by present perception.

Wittgenstein’s idea of purely empirical sentences in the *Tractatus* is, therefore, utterly unrealistic. All empirical assertions *presuppose* generic knowledge expressed in sentences that are *learnt* as conceptually true. Logical atomism and empiricisms cannot account at all for *dispositions* as *default inferences* that are responsible for the very fact that virtually any empirical utterance (*Konstatierung*) is fallible – due to the limitation of controlling dispositional properties *here and now*. The fulfilments of the normally, generically, *expected resp. predicted consequences* frequently lie in the future and are, as such, mere possibilities.

Almost all interesting properties of objective things and matters are *inferentially thick* or, what amounts to the same, *dispositional*. This must be so because only on their ground we can judge how the object to which I (want to) refer from here and now normally relates to you over there or then, to other subjects or to other objects.

As a result, we have to admit that, pace Russell and Wittgenstein, there are *no purely empirical state descriptions*. This was already an insight of Hegel’s semantic holism, which correctly starts its analysis not with sentences or assertions about objects, but sees that *joint coordination of qualitative distinctions* (sometimes of whole situations) lies at the ground of all objective reference and of our talking about objective things, matters, events, and processes.

2. There are no sufficient causes for all events in the world

We probably still live, as Heidegger puts it, in the times of world-views, ideologies, precisely when we do not grasp the conceptual status of our principles for representing and explaining the world. Heidegger’s warning not to confuse the world of beings and being with our idealistic world-pictures applies, for example,

¹ See [1. TLP 2.1–TLP 2.22 and TLP 4.01], where Wittgenstein talks about an image or picture of (real) reality (*Wirklichkeit*).

to the fulfilments of our wishes to make global predictions. The “belief” in a continuous causal nexus of all world events is only a counterfactual fulfilment of our wishes.

The principle of sufficient cause (Leibniz) or, better, of *causal connectedness in causations* of events by a suitable *causa efficiens*, is, indeed, deeply confused. The Latin word “causa” just refers to all possible themes and topics, things and matters. Not even a principle of continuity holds without exceptions for all bodily movements, at least if we view subatomic particles as “bodies”.

Hegel’s insight is still underestimated that it is part of *our* scheme that we try to represent the whole system of moved bodies as good as possible by a good distribution of dynamical *forces* responsible for the movements and changes of material bodies (things, matters) in a holistic way. Even though Newton’s system was and is a great success, it was and is naïve to think that such a theory could explain “all” events in the world. The theory uses the different *masses* of the different bodies effectively as a differential condition for inferential consequences in the overall system of mechanical interactions (*Wechselwirkung*). However, we should not overestimate the scope of this approach. Friedrich Wilhelm Schelling and Georg Wilhelm Friedrich Hegel, Johann Wilhelm Ritter and Hans Christian Ørsted saw already that electromagnetic forces are of a different type, such that they have urged a new understanding of physics that surpasses Newtonian mechanics.

The principle of continuity of bodily movements is vaguely expressed by the thesis that nature does not make leaps. However, it is wrong if we transfer it to a completely different realm of experience and speech, for example, when we apply it to subatomic particles and thus to electrodynamic and quantum mechanical phenomena. Nevertheless, some still talk as if these particles behaved in the same way as “normal solids” on the one hand, the *mass points* of 18th century mathematical mechanics on the other, even though all “particles” are theoretical objects of speech. In any case, the transfer of normal properties of solids to subatomic particles is not trivial. Otherwise, one would not be so surprised that the behaviour of these particles obviously differs substantially from the behaviour of solids.

These differences are known to be so essential that some again resort to a principle of direct action at a distance (*actio in distans*) – and thus distance themselves from the basic principle of relativity according to which, roughly speaking, all effects in space take time and are attributed to specific things in space. Some commentators even argue for *backward causation*, according to which the future causally determines the past.

I do not want to deny here that such a modelling of phenomena can make mathematical sense. However, if one likes to talk in this way, one expands the concept of a *causa efficiens*, which is bound to a directed time, the temporal sequence of the before and after of real movements of real bodies, into the domains of a *causa finalis*, and this already in quantum theory, not only in biology. The problem is not the use of anticipations of later events in the representation of natural processes, but the fact that one does not know that one is anticipating events in this way. Instead, one talks as if one were only reckoning with a *causa efficiens*. Incidentally, the question arises as to how the general principle according

to which nothing that has happened in the past can be undone by a future event coheres with the picture of backward causation.

In the context of a reversal of the arrow of time and a merely mathematical talk of backward causation, the result is incomprehensible mystifications of one's own modelling of experience. It is contradictory to assume, on the one hand, a universal causal connectedness of all events, while at the same time annulling this assumption without noticing it. In the first case, one implicitly operates with a concept of *causa efficiens* that presupposes that causation leads from the past to the future, as it results from classical and Einsteinian dynamics; in the second case, one talks about backward or teleological causation. No future can have some causal influence on the past. In reality, any teleological form of causal explanation, any *causa finalis*, is just *holistic*. At least in relativity theory, cause and effect as relations between (spatiotemporally localised) events still *presuppose* a distinction between the temporal regions past, present and future. According to it, there can be no *causal effect into the past* or on other locations in the pure present. The principle, according to which there is no purely simultaneous *actio in distans* at all, is however anything but clear and a priori true.

The “mechanical” principle of a universal causal connectedness of all events is thus, on the one hand presupposed as quite general; on the other hand, it apparently only applies to certain types of events. This means, in turn, that the Cartesian ideal of a mathematical total description of the whole world in the form of pre-determined trajectories of particles or *points* is an *ideal conception* that makes only *a desired mathematical form* of representation and explanation metaphorically explicit.

I am not interested here in an assessment of the reasons for the apparent abolition of some material-conceptual basic principles for bodily movements at the level of quantum-theoretical entities or particles. I am only interested in the fact that they show why the status of the principles mentioned is not only questioned in philosophy, but already worthy of discussions in physics.

3. There are no space-time-points in the world

When we think that some real explanations, for example, in solid-state dynamics, are quite exact, we are only saying that they come sufficiently close to our ideal wishes.

Our causal predictions of real movements of bodies are indeed highly precise in some respects. Yet, each of these “approximations to an exact ideal” is always of the structure of Platonic *methexis*. This means that we use rather coarse scales or margins of precision, at least in comparison to the ideal. How we proceed in this process can already be seen in a case that Plato himself apparently knows. We say, for example, that a real surface comes close to the ideal form of a plane, i.e. is sufficiently flat, if we are happy enough with its fitting conditions to a certain class of surfaces – for certain purposes. All real planes are therefore merely more or less flat. The same applies to straight lines, right angles or circles.

There is a concealed idealism or Platonism in modern mathematical natural science. It consists in the hypostasis of our own, ideally desired, forms of representation and explanation of experienced events in the world as “the” actual reality. Nancy Cartwright's question, how the laws of physics lie, is therefore entirely justified [3]. The question is how the laws of physics or the basic

principles of the other natural sciences are applied appropriately, how their status is to be understood, i.e. what it means at all to declare them formally true, and how we justify these formal truths of laws and principles. The first step to be taken here is, of course, the insight into the formality or ideality of the truth of natural laws and principles.

Max Planck famously thinks that the problems of quantum theory show us how and why human freedom of action is possible. However, it does show us only that our principles of representation and explanation in all natural sciences *are local* and fit to certain *aspects of measurement or observation*. I consider this to be an important insight of Niels Bohr. The laws of physics are no global and absolute basic laws of nature.

This outrageous claim gets clearer if we understand the real content of Werner Heisenberg's uncertainty principle. It estimates, so to speak, in general terms, *the mistake that we always make* when we calculate with mathematical points of space and time and *trajectories* and when we interpret the *differential geometric gradients as impulses*. Reality is never more precisely determined than Heisenberg's estimate. The details are not of interest here, especially because Heisenberg's uncertainty principle is only a special case for the much more general vagueness in all our applications of structural models to the world of empirical experience.

4. The method of science consists in experienced applications of good analogies

Our ideal world-views and favourite theories, or their axioms or principles, can always hold our thinking captive, as we can say with Wittgenstein. Such Platonism, or, better, Pythagoreanism, belongs to the childhood of philosophizing, as Hegel's apt commentary says¹. It is a feature both of the theological world-views of Mediterranean Stoicism, Hellenized Judaism, Christianity and Islam, *and* the anti-theological scientific world-view after the 18th century as the time of the so-called Enlightenment. Platonism was and is highly successful in both theology and science, indeed. The reason for this does not yet seem to be understood, especially because Plato himself was no Platonist. As the dialogues *Theaitet*, *Sophist* and (first part of the) *Parmenides* and its discussion about perception, *methexis*, *epistēmē* and *doxa* show, Plato clearly knew that practical experience is still necessary for a competent use of the ideal forms of *epistēmē*, i.e. the ideal theories produced in the sciences expressing generic knowledge. We use such generic knowledge in speech, representation and explanation. Applications of theories on empirical observation (*doxa*) still need experienced judgements indeed. Hegel calls this empirical form of a reasonable, yet never purely schematic or literal, application of theories to real, empirical cases "dialectical".

Our theories and world-views and the linguistic divisions of our experience of the world that are guided by them are neither the consequences of purely subjective "experience" in the sense of perception, nor simply the result of arbitrary settings. Rather, their implicit, empractical, and also explicit, verbalised, recognition *reflects* the generic experiences that we make in the use of our concepts in the

¹ Cf. [4. P. 321] with [5. P. 1076].

representation and explanation of the world. We develop them in the history of spirit, i.e. of humankind.

Like science, the development of philosophical language(s) for reflection on knowledge and truth is, indeed, a world-wide enterprise with many participants, mediated by all kinds of translations and copies of ideas and insights, together with many forms of commentaries. When we say that “we” develop the sciences and generic knowledge about forms as the conceptual system and transcendental precondition for all thinking, this “we” has a *generic* meaning. The same holds when we talk about “science”. It is just equivalent to say that *we develop* the sciences, the concepts and the languages and to say that the *sciences*, the concept(s) and the language(s) *develop*. Hegel’s Concept with capital C thus is nothing but general semantics encoding *epistēmē*, or, what is more or less the same, the international system of it called *langage* in French, emerging from our practices of translation. This is one of Hegel’s basic insights.

Reality shows itself via the average success of our always already generically constituted conceptual orientations. This makes talking about the empirical world as ambiguous as about “empirism”. In the narrow sense, only narrative and subjective reports about my or our observations of individual facts here and now, possibly as a result of a mere trial and error, are empirical. Genuine experiments are already controlled testings by which we move the limits of previous general ability and generic knowledge. In the context of a logic of research, Hegel’s word “dialectic” therefore refers to what Charles Sanders Peirce called the “abductive” form of justifying theoretical models as the best among the available modellings or linguistic representations or explanations in a field of phenomena.

5. Conceptual knowledge as a precondition of thinking contains pre-judgements

Conceptual norms of differentiation and differentially conditioned inferences hang together with general a priori knowledge. For many propositions to have any meaning at all, and thus to be false or true at all, many other propositions must already be true¹. The search for elementary propositions beyond these gradations is illusionary. Heidegger and Gadamer were therefore right to say that all empirical human cognition and even all forms of thinking rest on *pre-judgements*. In a certain sense, these preconditions come in steps. They start, so to speak, with what was called in earlier times pre-formed animal instinct. This old word stands for what we today could call with Alva Noë [6] “enactive perception”, which means that perceptual “inputs” lead in relative immediacy by inborn and acquired habits to a behaviour of living beings.

The main difference between animals and human beings lies in the fact that humans can produce spontaneously speech and silent thoughts. We thus are able to represent non-present possibilities relatively independent from the actual situation and check which of the possibilities are rational to count with in present actuality. No animal has access to this realm of possibilities and thus does not live, as we do, in a world of possibilities. The *grade of being a competent person* depends, indeed, on the grade in which we are able to *transcend mere actuality* of subjective or

¹ Wittgenstein suggests in [1. TLP 2.0211] that the question if a sentence has meaning could not depend on a (relatively a priori) truth of certain other sentences. However, his idea that we design “truly isomorphic” pictures of the world is already highly ambiguous, to say the least, just as the word “world” itself.

collectivist feelings of desire and satisfactions of self-interests in view of a possible *joint world* in which *all persons* live together. This transcendence surpasses by far the domain of all social animals and, what is even more important, all nationalisms.

In particular, a distinction must be made between a transcendental or presuppositional logical relation of sense-dependence (as Robert Brandom calls it in *Making It Explicit* [7]) and a quite different kind of dependence of the reference on the existence of the objects we talk about. Our talk of the moon is sense-dependent on our distinction between suns or stars, solar planets and moons. It is reference-dependent on the fact that the moon exists, existed and will exist, independently of what we know about it. By saying something like this, and perhaps by adding that the other things of physics really do exist, such as electrons or other subatomic particles, we are admittedly investing words that are meaning-dependent on our knowledge or our theoretical convictions. We immediately erase the time-dependency and perspectivity of this very knowledge, abstracting from ourselves as speakers, and speak *de re* about the reference-dependency of the good experiences we have had with the corresponding theories.

Brandom shows how we are to understand this form of speech *de re*, namely not as the eradication of any perspective of speakers in a statement of nowhere about a world in itself, but by ourselves standing up for the assertion as true. The distinction between a speech *de re*, for example about the sun, and *de dicto*, for example about the sun-god Helios, who the Greeks think leads the sun-chariot, is thus an internal distinction. It concerns the difference between one's own assumption (undertaking; also acknowledgment or recognition) of validity claims within each of our conceptually formed systems of knowledge and the attribution (assignment) of such validity claims to others, if necessary without assuming them or under criticism of their falsity. While I would say in *modus de dicto* that the Greeks believed that the sun was a disc on the chariot of Helios, I cannot say anything about this disc *de re*: it does not exist, as I know. I can say in the *formal modus de re* that the sun-disc might have been made of gold, just as I can say of *Rübezahl* that *according to the fable* he was an earth spirit in the Giant Mountains. But then the whole context is already marked as a *de-dicto* context, so to speak.

De-re statements are distinguished from *de-dicto* statements by different inferential norms for the respective commitment of the speaker (with respect to substitutability rules), as Brandom shows in detail, adopting logical insights that Willard Van Orman Quine developed in *Word and Object* [8]. This makes it even clearer than it already was in the writings of Gottlob Frege that in so-called oblique contexts the *speaker's perspective is always relevant* for the inferential content. It therefore belongs to the *logical analysis of the meaning of a statement* and not *merely to an extra-logical pragmatics*. This holds, however, not only for cases in which we speak about statements of others and distinguish our world reference from that of others.

6. Theories are generic articulations of general experience

In the *development of concepts*, a certain *harmony* between *distinctions* of species of things or matters and reliable *dispositions* is essential. Brandom shows this at an example already discussed by Michael Dummett. In the French expression “boche” for Germans, as its use goes back to World War I, there is *no* harmony between the criterion for application and its inferential content. The

criterion for being a *boche* is just to be German. However, a boche is especially brutal, barbarious and stupid.

In mathematics, there is a perfect harmony between the differential conditions to fall under a predicate like “prime number” or “rectangle” and its inferential consequences. This harmony is man-made, such that all mathematically true sentences express at the same time mathematically allowed rules of inferences, just as a true conditional of the form $\phi \rightarrow \psi$ corresponds to an allowed rule $\phi \Rightarrow \psi$ and vice versa.

Another insight follows almost from what has been said so far: There is no classification of things or qualities without corresponding inferential commitments and entitlements, i.e. permissions to infer something and obligations to justify the inferences. Already the early Wittgenstein remarks that we cannot be interested in mere classificatory statements without further inferences. Nevertheless, he did not see how inferential content enters state-descriptions.

Brandom’s idea of sanctioning behaviour against mistakes in rule-following and sanctioning acts against all kinds of abuse cannot *define* the norms they support. The right way of dealing with inferential commitments and entitlements does not coincide with being not sanctioned by other speakers or actors. Feelings of satisfactions or dissatisfactions do also not suffice as criteria. The empractical mode of existence of forms and norms in speech acts and consequential actions intrinsically refers to sufficient fulfilments of forms.

What is even more important is this: In relation to the world, conceptual inferences cannot be neatly separated from normal case experiences. In this, Hegel and Quine agree. Nevertheless, we should not fall into an all too generous theory holism as heralded by Quine, Paul Feyerabend, and Richard Rorty. Hegel’s development of Kant’s transcendental philosophy seems to do a better job. It recognises the methodological gradations in our articulation of empirical knowledge and thus the relative a priori nature of generic knowledge.

Wittgenstein also came to similar conclusions: Practical knowledge of certain conceptual truths (inferences) W_1 are systematic prerequisites for the sense-understanding of certain other empirical truths W_2 or statements qua meaningfully uttered propositions. That is, the sense-determining presuppositions W_1 can neither be adequately justified nor refuted by examining the individual empirical correctness of W_2 . Nevertheless, there are experiential checks on the conceptual “pre-judgments” explicitly encoded in W_1 relative to W_2 . Therefore, and only therefore, a philosophical reflection on *the concept* as the whole *system* of content-determining general knowledge (*epistēmē*) is of a different type than *empirical controllings of a statement* (*doxa*) that is already well-determined in terms of what I call *differentially conditioned inferential content*.

We thus have to modify Quine’s thesis that the conceptual (“analytical” or, better, what counts a relative a priori conceptual knowledge) cannot be distinguished from the empirical (“synthetic”). Quine’s “naturalization” of epistemology therefore goes much too far by its renunciation of further reflections on the various forms of knowledge. We should better leave these undesirable developments in analytic philosophy behind.

In any case, linguistic competence requires not only the mastery of lexicon and syntax, but also of content-determining inferential norms, as I would like to summarize the (criterially effective) forms of correct material-conceptual reasoning

and judgement. Loosely following both Paul Lorenzen's use of the German word "materialanalytisch" and Robert Brandom's use of the word "material", I use the German word 'materialbegrifflich', in English just: 'conceptual', in order to express the following: Material, but generic knowledge determines the form of correct prima-facie inferences of judgements.

In this context, we have to distinguish premises and forms of inference that stem from a public and social domain of learned general knowledge from premises that occur as special knowledge and cognitive claims of individuals, even many individuals. The latter belong to a separate category of empirical statements.

7. We count with fallibilities in applying generic norms

When I hear from you that a cat is lurking over there, I assume that it is neither a tiger nor a stuffed animal. I also "infer" from your statement that the animal is not dead. Dead animals do not lurk. I expect that the animal does not just look like it is lurking. If it turns out that the animal is blind and deaf, you would have to retract your statement. If you know that a normal expectation, such as that the animal is not seriously ill, is not fulfilled, you usually have to make that explicit. It is in this non-psychological sense that we "expect" a cat to have four legs and not just three, that it will come into heat regularly and, if not sterilised, that it will normally have some kittens. In a similar sense, we expect a garment that you say is green to stay green, when we take it from a show into sunlight. If it does not, you have to correct yourself and say that it just looked green in the yellowish light of the warehouse.

Without the public domain of material conceptual general knowledge, the author's commitment and the recipient's entitlement corresponding to it would obviously remain undetermined in terms of content. The criterion for what would be a permissible inference or a related asking for or giving of reasons would then be missing. Without a judgemental and experienced projection of generic conclusions onto real cases and without the associated resistance of the reality experienced through the senses and the associated validity control, a mere verbal conclusion and schematic reasoning would remain a kind of spinning in the void, an empty turning wheel, as John McDowell puts it.

The concrete application of conceptual resp. generic knowledge in a real-world context, however, is, I repeat this central point, by no means schematic. It presupposes the mastery of a kind of *projection filter*, which consists of an *appropriate consideration of the respective limited speech context* and a *consideration of relevance connected with the concrete communication situation*.

This can be seen particularly well in dealing with the truths of ideal mathematical geometry. Their projective use in the representation of real body shapes or spatial relations requires corresponding power of judgement. Not every theorem of ideal geometry that can be formally deduced is a direct criterion for whether a surface is sufficiently flat or an edge sufficiently straight. The propositions that are generically marked or set as "true" in Euclidean geometry therefore by no means simply articulate a representative theory of "empirical space". They cannot be directly projected without a special consideration of a practice of measurement that we have set up accordingly.

For empirical statements, there is always the possibility that a correction is necessary. This is not merely due to our inability to know anything certain. It is a

systematic part of our language and part of the form of communication, linguistically or otherwise symbolically mediated. All judgements about what we perceive already contain *an inferential surplus due to the inferential norms outlined*: The individual subject, the speaker, by no means completely controls whether “all” default inferences are secured.

Empirical individual statements by individual subjects therefore do not belong to the category of generality of trans-subjective knowledge of Plato’s *epistēmē*, but only to the *doxa* of subjective certainty. The justification of the assurance or the reliability of the statement is still evaluated “by us”, not only by the concrete addressees.

8. Only in good cases we need no retractions

Plato argues in the *Theaetetus* that the so-called “standard” definition of “knowledge” in present day “epistemology” with Edmund Gettier as a prominent figure is wrong from the beginning. Plato’s formula reads *alethes doxa meta logou*, which I would propose to translate by “empirical assertion with a proof” (not just: with “some justification”). Plato refutes the definition by his later analysis of Parmenides’ differentiation between *epistēmē* as generic and time-general truth canonized in a public domain and *doxa* as merely perspectival empirical apperception.

However, when communication works, no further questions about the “actual truth” of an empirical statement like “there is milk in the fridge” or “this is a barn” are meaningful. This means the following: If I tell you that there is a chair outside, you go out, bring it in and sit on it, doubting the “real” existence of the chair no longer makes sense. Empirical individual knowledge in this sense is always more or less situational, limited. It is indeed fallible, insofar as certain conditions reaching into the future may not already be assessed as fulfilled; but it finds its fulfilment in successful communication and cooperation, just as goal-oriented action finds its fulfilment in reaching the goal.

At the same time, ideal ideas of perfect fulfilment, not unlike the ideal forms of geometry in real use, only serve the reflection-logical articulation on the ideal forms of knowledge that are never fulfilled in all details. Ideal forms articulate a kind of direction to perfection and always come with a measure for judging about sufficiently good satisfactions of criteria according to situation, context and relevance, as Plato already seems to have known.

What we refer to as “empirical hypotheses” are general sentences that are still tested whether they can be canonized as content-determining default inferences. In normal language, we use the word “knowledge” not only for general knowledge, which I as an individual might have learned at home or in school, but also for empirical assertions about what I (assume or think to) perceive here and now.

Empirical claims are necessarily “finite”, i.e. always to be judged as sufficient or insufficient in relation to the particular situation, perspective and relevance and to be understood accordingly. Material conceptual knowledge is achronous, in this sense “eternal”, i.e. “situation-invariant” – but only in form, status and role. It can change in details, in the course of our work at the concept, which amounts in part to the same as what we do in the sciences. In the sciences, we are not interested in merely historical narratives of singular cases, even though in all cases of

exceptions like “miracles”, we indeed look for generic causes or reasons that turn the case into an instantiation of some generic form.

Generic truths thus are no empirical assertions. They belong to a system of non-linguistically and linguistically learnable *normal expectations*. They form the background for what speakers or authors can or must say or write in order to be understood correctly in a particular case (“to the best of their knowledge and belief”), and on which listeners or readers may then rely.

9. Formal logic holds in all its details only in purely mathematical set theory

Perhaps we can now see a little more clearly how generic knowledge essentially co-determines the inferential content of empirical statements in the form of a system of default conclusions and normal expectations. As material knowledge, it goes far beyond purely formal inferences, especially beyond mere definitional and terminological language-rules as, for example in the standard use of the logical words “not”, “and” and “for all” defining the rules of Frege’s predicate calculus, as it holds in all details and without exceptions only in pure arithmetics.

Inferences that operate merely on the level of syntactic-configurative deductions are called “purely schematic” or “purely formal”. Purely formal in this sense is, for example, a conclusion or transition from “ φ and ψ ” to “ φ ” or from “ $\forall x.\varphi(x)$.” (read: “for all x holds $\varphi(x)$ ”) to “ $\varphi(N)$ ” for appropriate names and namings N in a genus G . Negation “non” or “ \neg ” poses a special problem, especially because of the following three “Fregean” principles:

1. For any proposition φ (“in G ”), either φ or $\neg\varphi$ is true.
2. For any proposition $\varphi(N)$ there is a predicate $\varphi(x)$ in G such that for any other M in G either $\varphi(N)$ or $\neg\varphi(N)$ is true.
3. Because of 1. and 2., all predicates $\varphi(x)$ split G up into exactly two parts, namely the set $A = \{x \in G: \varphi(x)\}$ and the set $G-A = A^C = \{x \in G: \neg\varphi(x)\}$.

Frege’s formal logic turns out as a complex scheme for defining complex predicates on the ground (a) of negations (\neg), universal quantifications (\forall) and conjunctions ($\&$), (b) of *basic* relations in G like, for example, the relation “ $x < y$ ” in the numbers and the identity $x = y$.¹

Unfortunately, predicates defined in a Fregean way fulfil all the conditions 1.–3. only in the “harmonious” domains G of entities and predicates in pure mathematics. There we can *force* G to fulfil the condition of harmony by the very constitution of G . We cannot do so when we talk about the empirical world. This is so because for any world-related predicate $\varphi(x)$ there are *intermediary* cases N , which we silently exclude if we use formal logic. Nevertheless, one tends to overlook that the continuities of the world produce *contradictions*. For intermediary cases N , *neither* $\varphi(N)$ *nor* $\neg\varphi(N)$ “holds” or, what sometimes amounts to the same, $\varphi(N)$ *and* $\neg\varphi(N)$ “hold”. The causes for this lie in the limits of possible

¹ A relation R of Hegel’s category “being for itself” or *Fürsichsein* fulfils the condition that from $g_1 R g_2$ it follows that $g_1 = g_2$, such that it is a *metalevel relation* “of an object in G to itself”, which is, in fact, a relation between different, but equivalent, *presentations* or *representations* of *one* G -object. Hegel’s expression *Sein-für-Anderes*, “being for others” refers to relations R such that we can conceptually infer $g_1 \neq g_2$ from $g_1 R g_2$, just as we do in the case $x < y$.

joint differentiations, grounding all world-related truth-conditions, as Hegel realizes.

All “true” sentences and deductive rules of Frege’s *formal logic* “hold” indeed just like those of *geometry* only for the *ideal constructions* of mathematics.

Nevertheless, when we want to know about which object(s) someone talks, we have to find out 1) the relevant system G of different *representations* or *appearances* and 2) the appropriate *equivalence* relation between them that *define* the *identity* of the objects we want to talk about.

Especially in its “ontologies”, analytic philosophy tends to underestimate a third point, namely, 3) that the so-called Leibniz-Principle is merely *formal*.

The principle says that the G-identity $g = g^*$ between instantiations of G-variables of a conceptual structure G holds if and only if *no G-predicate* $\varphi(x)$ makes in its application to instances a distinction between g and g^* .¹ This means that G is not just determined by the identity of possible objects but also by a fixed system of G-predicates $\varphi(x)$, harmoniously fitting to the G-identity “=”. There are, therefore, as many identities in our languages, in abstract domains and in the empirical world, as there are conceptual genera or species resp. types of things. Analytic philosophy is still in need of grasping the significance of this “Hegelian” insight.

We can put the problem also in this way: We never can abstract from all material content of the names and predicates in a genus of things. If we try to do so, we do not arrive at a philosophical logic of language and its relations to reality, as Fichte suggests,² rather at the highly idealistic constructions of mathematics.

Main steps in the history of (commenting on) these constructions are: a) Plato’s arithmetic of pure numbers and pure proportions, b) Euclid’s geometry of pure forms, c) their unification in Descartes’ analytic geometry, and d) Cantor’s naïve set-theory \mathbf{V} .³

Frege’s formal logic is, indeed, just an explicit notation for possible predicative definitions of subsets in the so-called cumulative hierarchy \mathbf{V} of all Cantorian sets, i.e. in “higher arithmetic”. \mathbf{V} is *the largest possible domain for the pure variables of formal logic* – and all its “power sets” are even defined by a scheme wholly analogous to Anselm’s proof of the existence of the whole world (sometimes called “nature”, sometimes “God”, as Spinoza recognizes), namely as

¹ This means, in turn, that $\varphi(g)$ “holds” but not $\varphi(g^*)$. Of course, we still have to think about the difference between the different *representations* g and g^* and the identical or different G-objects that are represented.

² “In der totalen Abstraktion von durchaus allen materialen Objekten des Wissens <...> besteht die Logik, und alles, was sich Philosophie nennt, [ist] seinem innern Geist nach nur Logik” [9. P. 224].

³ We can start the constitution of Cantor’s pure *hereditary-finite* sets \mathbf{V}_ω with one term or name \emptyset – which is later viewed as a name for “the empty set”. The notational system for set formation is easy: If t_1, \dots, t_n are already names for pure sets, then $\{t_1, \dots, t_n\}$ as well. We say that the set thus named has exactly t_1, \dots, t_n as elements and that different names represent the same set if the elements are equal (such that their order does not play a role). The usual definition of \mathbf{V}_ω as sets designated by sortal terms of the form $\{x: x = t_1 \text{ or } \dots \text{ or } x = t_n\}$ *already presupposes* a well-defined genus G for the variable x, for example \mathbf{V} . However, \mathbf{V} is *constituted on the ground of* \mathbf{V}_ω via the so-called *power set* of all different subsets of \mathbf{V}_ω followed by *all* possible subsets of *all* resulting power sets. We obviously can embed the *pure numbers* in diverse ways into \mathbf{V}_ω . As this short sketch shows, Cantor’s pure sets do not result at all from the empirical, time-dependent, *classes of concrete things*, as Aristotle, Hume, even Frege and Russell and their successors still believe(d). Empirical classes *change*, since all concrete things *disappear* in time, just as apples in a basket or living beings. All mathematical *purity* rests, instead, on the arbitrary *reproducibility* of “identical” forms, including names and terms. Plato was more adept here, since he defined already *the real numbers as pure proportions (of lengths) in pure geometric forms*.

the largest possible sets of subsets of a set¹. We obviously must still learn to understand the development of formal logic and set theory from Dedekind, Cantor, and Frege to Gödel, whose theorems are undeniable proofs of the facts mentioned.

Abstraction is never just *neglecting particularities*. But not only the definitions of abstract objects or general content, all determinations of concrete object also presuppose *equivalence relations* (for example in perspectival changes), such that *objectivity* rests on *coarser* distinctions than *syntactic forms* and qualitative *appearances*.

10. The sciences are institutions for developing language in a world-wide co-operation

The difference between purely verbal terminological inferential rules and materially thick conceptual inferences lies (1) in the way they are justified and (2) in that in the last case the rules correspond to some normal form and behaviour of instantiations of types. All references to empirical things and matters, events and processes are mediated by concepts, i.e. generic species or types in such a way that it is naïve to assume that types are just sets of empirical tokens or species just classes of empirical individuals.

In the formal-analytical and terminological case, the linguistic setting is a purely verbal convention of abbreviative definition just as in the following standard examples: “bachelor” is a shorter expression for “unmarried (young) man”, “primes” is short for numbers that are not the product of smaller numbers. In the material-conceptual case, a sentence expressing a rule or norm fixes a general knowledge of the world – as in the case “whales are mammals” – or articulates inferential norms of a general practice – as in the case “there are sanctions for trespassing legal norms”.

The word “general knowledge” names only a sub-area of the meaning-determining public domain. Wittgenstein’s talk of a form of life, on the other hand, sounds slightly too big and, like the word “culture”, sometimes carries with it certain relativistic connotations.

We do not only codify everyday experiences in the conceptual rules of our languages. We develop generic knowledge explicitly since the emergence of diverse practices of writing, as the traditions impressively show that reach from Mesopotamia and Egypt to India, China and East Asia. Of course, there are parallel developments in the Americas. All holy books belong to these traditions. The difference of the sciences, as they are developed in Ancient Greece, lies in their idea to *control* implicit traditions of general knowledge and to institutionalize the development of generic knowledge (*epistēmē*). Pythagoras, Heraclitus, Parmenides and Plato are founding fathers for this idea. Since then, we have been developing and controlling the “conceptually basic” knowledge we teach and learn in schools in world-wide co-operations, at least in the good case. The sciences thus provide us with the *material backbone* of our *semantic systems* for *understanding*.

¹ The entities and relations in V , the cumulative hierarchy of all pure sets “above” V_ω as the standard model of axiomatic set theory are neither just psychologically imagined nor metaphysically postulated. I.e. accusations of psychologism and Platonism (for example against Cantor or Gödel) are both wrong. In order to see this, we must, however, learn to comprehend general forms explained by phrases like “and so on” far beyond lists of “all” names and namings for pure sets in V and far beyond the wrong idea that we could (schematically) *decide* for all sentences and utterances about V_ω or even about V if they are true or not.

Just as we have different systems of ciphers and terms for numbers like the Roman or Arabic numerals as “XII” or “12” and number-words as “twelve” or “dozen” and corresponding translation schemes, we have systematic translations between different languages. Even though the first development of generic knowledge or, what amounts to the same, of concepts take place in a particular language, humans are always intelligent enough to translate the important ones into “all” languages. Under this view, there is virtually *only one* human language (French: *langage*) which is essentially the same as Hegel’s generic Concept with capital C, i.e. “der Begriff”, that is, in turn, the general material semantic system of language as such.

However, the “Romantic” movement of looking at the peculiarities of national languages after Johann Gottlieb Herder and any merely “philological” approach to the original language of a text like the Bible focus on the *differences* between the languages and the expressions. This has the unfortunate result of overestimating national languages and underestimating the deep fact, that *content* presupposes *equivalence relations* in perspectival changes such that on the level of content our distinctions are not finer, but coarser than on the level of particular languages or expression. In other words, any content can be expressed more or less sufficiently in any language. Even though the inferential norms of default inferences and possible readings for texts in an original language are “more precise” or “distinct” compared to the set of possible translations into other languages, we know at the latest after the good experiences with automatic translation systems like, for example, Deeple Translator that and how general content is always *transnational*. In fact, all modern European languages owe most of their semantic norms and rules (1) to translations and glossaries of Ancient Greek and Latin, (2) to the emergence of written literatures in the diverse “vernaculars” (at first medieval Italian, French, English, and German especially since the 12th century), and (3) to the re-emergence of the sciences in Western Europe, partially mediated by Arabic sources.

We should understand the modern sciences, indeed, as a kind of enterprise to canonize generic knowledge in developed languages, at first in Greek and Latin, but then also in the new national languages with only petty differences between, say, Slavonic, Indian or Chinese languages and cultures. At the latest in the 17th century, a kind of all-European culture emerges, despite all the competitions between countries, such that it is almost ridiculous to muse about an allegedly necessary “new identity” for Europe. More recently, a really world-wide culture of knowledge and reason with its various forms of life and co-operation emerged. Not to acknowledge this would turn ourselves back into a merely regional civilization.

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