Lecture no. 3:
Frege's idea of a 'concept script': Its importance for language processing, and its limits as a model for natural languages.

Hans J. Schneider

Abstract: In the tradition of Leibniz the German logician Gottlob Frege took important steps towards spelling out in detail what he called a 'concept script', a language that follows in its structure what the laws of logic require. Frege's work together with the work of Bertrand Russell and Alfred North Whitehead constitutes the foundation of all of modern logic and of the influential philosophical school of 'Analytic Philosophy'.
The lecture will discuss the philosophical ideas behind Frege's project and will show why they could appear convincing and promising to many philosophers, and why they indeed had tremendous consequences in language processing, artificial intelligence, and information technology. It will then turn to the field of *natural* languages and will show that 'creativity' as a characteristic of human linguistic competence is not the same as the 'recursiveness' we implement in logical systems.

In this third lecture I will discuss some basic ideas about language that we find in the writings of the German logician Gottlob Frege (1848-1925; picture). In my first two lectures I had occasion to mention his work more than once. This indicates that it still is of fundamental importance in the Philosophy of Language. This is sometimes expressed by calling Frege the 'grandfather of Analytic Philosophy'. Today I will give you a more detailed introduction to some of his basic ideas than I have done in my last lectures. It is my goal to make you see how fascinating and promising these ideas can appear.

For Frege natural language was not the focus of his attention. It was of interest for him mainly for two reasons: Firstly, he thought that he was forced to take it into account in order to get a grip on the realm of what he called 'thought'. For him this is an ontological area, independent of language and of the human mind. But, as he himself remarked, without language we would not be able to reach the higher levels of thought. So we need to look at language in order to find out something about the laws in the realm of thought. And the second reason why natural language was of interest to Frege was because it served him as a point of comparison. He makes quite a few interesting observations about natural language at points where he wants to explain why and in what respects his 'concept script', designed to spell out the *logical* structures of *thought* should be different from it, and (for mathematical and scientific purposes) this often means: where his concept script would be better than natural language. But it is important for us to note that Frege himself never wanted to develop a theory of meaning for natural languages. The plans for such an application of his thought were developed only after Frege, by thinkers like Donald Davidson and Michael Dummett.

My lecture will proceed as follows: In the first part I will discuss Frege's basic *philosophical* ideas, his project, what he wanted to achieve, and why he thought that it can be realized. Important parts of his program he was able to execute, to realize himself.

In the second part I will discuss the basic steps he took to achieve his goal, i.e. his basic distinctions concerning the elements of sentences. This will include a short discussion of quantification (because here is one of Frege's most original contribution) and to

propositional logic, i.e. to the possibility of putting sentences together in order to form a new sentence that has a content of its own, a content that differs from the content of the same two sentences when they are uttered as a sequence of units that are independent of each other.

I will then have all the material I need to explain in the third part of my lecture, in what sense Frege made a substantial contribution to *formal* logic, i.e. in what sense he made possible a *formal treatment* of logic and language. Such a formal treatment is one of the preconditions that must be fulfilled in order to enable scientists and engineers to design machines that can be said to *calculate*, to *compute*, and to *process language*.

In the fourth part of my lecture I will compare the conceptions developed by Frege for his special case of Mathematics to the understanding that *Wittgenstein* offers of *natural* languages, as I have described it in my second lecture. For those who have heard my Wittgenstein lecture I apologize that I have to repeat certain things, but since these matters are difficult, I hope this is no damage.

In the fifth part of my lecture, finally, I will draw some conclusions for the question what a theory of meaning for a natural language should look like. Here I will have to enter current controversies about what role the Fregean model can play and what has become of the original ideas of Analytic Philosophy that our thoughts about language should be of epistemological relevance.

1. Frege's vision and his first steps towards its realization

Since it is a part of my goal here to explain some of the fascination that the modern philosophical school of 'Analytical Philosophy' had with the ideas of Frege, my first question is: What does 'analytical' mean in this context? As a first step towards an answer we can think of the old idea of an 'analysis' of words and sentences. When we explain the meaning of the word 'bachelor', for example, by saying that it is applied to unmarried men, it has long been common to describe the relation between the words involved by saying that the meanings of 'unmarried' and of 'man' are *contained* in the meaning of the word 'bachelor'. The process of bringing this to light was accordingly described as 'analysis': Hidden or *implicit* components of meaning, that are not visible by looking at the *sign* (i.e. by looking at the word 'bachelor', as it might be printed in a text) are brought to light, are made *explicit*, in something like the way in which water is analyzed into its invisible components hydrogen and oxygen. The usefulness of such an analysis lies in the fact that ignorance of such 'meaning components' can lead our thinking astray, and in the idea that (positively) explicit knowledge of such components is necessary for a clear understanding of the meaning of the expression in question and for drawing logical conclusions. Accordingly, complex expressions are taken to have a clear meaning if they have been 'analyzed', i.e., have been broken up into constituent expressions the meanings of which are less apt to be unclear or controversial.

Frege applied something like this strategy also to sentences. Here too an 'analysis' can bring out 'hidden' meaning-components. An example for this is the following: When a sentence like 'lions show aggressive behavior against humans' is paraphrased as meaning '*all* lions show this behavior', the meaning-component expressed by 'all' had at first been hidden and has now been brought to light. In a slightly different case it is the

semantic structure of the sentence that cannot be unambiguously read off from the words alone because some of them can be understood in more than one way. The sentence 'the lions show aggressive behavior against humans' might be paraphrased as 'our group of lions here in the London zoo …', or as 'all lions …'. A sentence like 'you may have cookies or fruit' can be supplemented by 'but not both' or by 'or both'; our normal ways of speaking often leave it open whether what the logicians call the 'exclusive' or the 'inclusive' meaning of 'or' is intended.

These cases of ambiguity and implicitness need not worry the speaker of everyday language, but where maximal clarity and precision is required (like in discussing the validity of mathematical proofs) they do matter. And it was his work on the foundations of Mathematics that inspired Frege to develop what he called a 'concept script'. He envisaged it as a language that would, on the one hand, be quite restricted in that it would contain only sentences that can be true or false. In Frege's words: It would treat only contents that are 'judgeable'. And this means, among other things, that a concept script would treat no commands, no questions, and no expressions of feeling. Frege was quite aware that it would be absurd to recommend such a symbol system to be used in everyday life. He himself remarks that such a proposal would be like recommending the use of a microscope in the performance of everyday tasks: Wearing this optical instrument in front of one's eyes would clearly be a great hindrance in everyday life, it would be of no help, although in a particular context it *does* improve your vision. But on the positive side Frege's 'concept script' was meant to avoid what must, in his field, be seen as two shortcomings of our 'ordinary' or 'natural' language: First, it would make *explicit* all aspects of meaning that, in ordinary communication, are understood only implicitly. Nothing, Frege declared, should (in his delicate special field of inquiry) be left to guesswork. And secondly his concept script should avoid all *ambiguity*: *One* form of signs should express only *one* kind of meaning. To use the same example again: one should be able to *see*, i.e. to read it off from the sign, whether an inclusive or an exclusive 'or' is intended by the speaker. So 'nothing implicit!' and 'nothing ambiguous!' are the two imperatives that rule the construction of his logical notation.

Is the project of such a construction realistic? It seems that it only takes a quite simple consideration to justify an affirmative answer. Therefore, great hopes were invested in in the development and refinement of such a construction, and not all of them were vain hopes. The considerations that make us think that such a project can be realized are the following. As the few examples I have given already show, every speaker of English is able to note (to 'perceive', to 'see' in a metaphorical sense) implicit aspects of meaning as well as cases of ambiguity when such features occur in an utterance. Normally she can *comment* on them, she can easily formulate *paraphrases* that make explicit what has not been *said*, but has very often been *understood*. And so too in the case of ambiguity: Every normal speaker of a natural language can easily formulate paraphrases and comments, can use additional or alternative expressions when the need arises to resolve an ambiguity. But if indeed such improvements of communication are easy to provide in any given case, there seems to be nothing that would preclude a *systematic approach* to such improvements. And this is what Frege had in mind. In other words, these observations seem to show that it should be possible to gain an overview of all the ways in which meaning elements can be combined in order to form expressions for a complex content, i.e. to form a sentence that can be true or false. Accordingly, it should also be possible to develop a notation that would (firstly) exhibit *all* aspects of meaning (at least as far as they are relevant for truth), leaving nothing to guesswork, and would

(secondly) do so in an *unambiguous* way, so that there would be no difference in meaning that would not be apparent in a difference between signs. If this were achieved, any such difference could be *seen* not in a metaphorical, but in a literal sense. The reason to think that this is a realistic project seems simple: Since we can *detect* what (from the perspective of a mathematical logician) are shortcomings in the workings of our natural languages, and since we can *avoid* or *repair* them in any given case by choosing a more appropriate mode of expression, it seems that we should also be able to systematically exclude these shortcomings in a notation especially constructed for limited scientific and philosophical purposes. This does not exclude that the expressions we get in this way may turn out to be clumsy and unappealing for the purposes of everyday life, like Frege himself has seen and has expressed in his comparison of his concept script with a microscope.

2. Frege's basic distinctions

What then are, in Frege's eyes, the 'elements of meaning', can we make a complete list of them, and how can we work out an overview of the possibilities to combine them in such a way that they would express truth or falsehood, first in Mathematics, and then in Science? Frege was quite careful to avoid a trap that one might fall into right at the beginning. When the possibility of a 'combination' of signs into a sentence is what is at stake, we have to see to it that we do not end up with just a *list of words* instead of a sentence. There is a difference between a complex expression with a unified sentential character on the one hand, and a succession of a number of utterances tied together only by their proximity in time (or their proximity on a piece of paper), on the other. As I have mentioned in a previous lecture, a shopping list (or a list of guests for a party) is a 'list of names': It does not show the unity that is characteristic of a sentence. So we have to ask right from the beginning: What constitutes the unity of a *complex sign*, whereby is it distinguished from a mere succession of simple signs?

Frege's answer to this question is his doctrine of 'unsaturated' expressions, which is inspired by his work in Mathematics. His analytic procedure consists in starting with a consideration of a whole 'thought', a content that can be affirmed or denied, and only then breaking it up into parts. These parts are (on the level of expressions) the following: First of all we have *proper names*. Examples are names of cities or persons (like 'Paris' and 'Caesar') but also expressions like 'my eldest brother'. Expressions of this kind pick out (for example) one individual person and so they can function like proper names. The technical term for them is 'definite descriptions'.

The second category is constituted by the so-called *concept terms*. Examples are expressions like 'city', 'person', or 'family member'. They are used to ascribe some property to the object named, or to express a relation in which two or more objects stand. So an important part of Frege's philosophy of language is his claim that not all meaningful expressions should be understood as names. This corresponds to the fact that in Mathematics we have not only 'names of numbers' like 'five' or 'thirteen', but also functional expressions like 'plus' or 'divided by'. In a symbol system containing only names, complex expressions could be nothing but *lists* of such names. So one important point in Frege is that he saw that concept terms are not names; like functional expressions in Mathematics they can play their role only *in connection* with names. Frege uses a figurative expression to describe this, he says that they are 'unsaturated';

their expression in his concept script therefore contains an empty space (marked by a letter like 'x': 'x is green') that indicates the place where a name must be put in, so that a complete expression results. Using another figure of speech Frege says that a proper name can 'stand alone', like a person, whereas different kinds of unsaturated expressions (concept terms or other functional expressions) can be added to such a name, like one or more coats can be put over the shoulders of the person. The coats, then, *cannot* 'stand upright by themselves'.

Thus distinguishing kinds of expressions enables Frege to give an account of the unity of the sentence. This unity arises from the 'cooperation' of words of different kinds, which have quite different functions (or 'logical roles'), namely (on the most basic level) those of 'naming' and of 'speaking of' (or 'predicating'). Relational terms like 'x is the brother of y' he treats as predicates with more than one object term (name). The relationship between object and concept, which is at the basis of all expressions that can be true or false, Frege calls the 'fundamental logical relation'. In order to understand the unity of the sentence, then, we have to understand the interplay of these two (and later some more) types of words.

This interplay constitutes what is called the 'logical structure' of the sentence in question, and it is clear that the meaning of 'logical' here is defined in view of the kinds of *content* the expressions have. So, at this stage in the development of Logic, the term 'logical structure' does not designate something 'formal' in the sense of 'something devoid of meaning'. Therefore we can also speak of *semantic* functions or roles, to avoid a formal reading of the adjective 'logical'. In the process of *working out* and *arguing for* his 'concept script', Frege uses the word 'logical' in its content-related, not in its formal sense. So Logic comprises the 'conceptual' level of language (following the old understanding that logic is the theory of concepts, judgments, and deductions) so that instead of 'logical' (and the much later coined term 'semantic') we can also speak of Frege as treating 'conceptual' problems when he discusses the basic elements of meaning. Accordingly, he has chosen the term 'concept script' for his newly developed symbol system. But let me repeat here a point that I have already discussed in my first lecture: For Frege concepts are not *psychological* entities. They have their place in an objective realm that the Logician tries to explore; they are not in his own mind.

One of the points where Frege is most original and where his thought has had the greatest impact in the history of Logic is his treatment of quantification. This step is original with him and might be seen as his most revolutionary innovation. This is sometimes forgotten because in the meantime his view is universally accepted and has become very familiar to everybody who had ever taken Logic classes.

Here his doctrine of 'unsaturated' expressions brings a big advantage for Frege: Analyzing a sentence like for example 'the lion is man's enemy', Frege no longer looks for a 'general object' like 'the species of lions' (a 'platonic form'), which in the Middle Ages had been taken to be *named* by the expression 'the lion', so that with the expression 'man's enemy' something is predicated of this general object. Rather, Frege treats both 'lion' and 'man's enemy' as unsaturated predicate expressions and paraphrases the sentence as: Whatever name of an object will be put into the places of 'x' in the following expression, the result will always be true: If x is a lion, then x is man's enemy. The quantifier for him is a 'second order concept', a concept expression speaking about concepts.

So our inventory of signs at the moment comprises names, concept expressions, and the universal quantifier 'for all'. When we want to proceed to complex sentences (in the sense of combinations of more than one sentences that, in being combined, form a new sentence) we have to add what is now familiar under the name of 'truth functions'. These are once more functional expressions (i.e. not names). They correspond to some degree to our familiar sentence-connecting words like 'and', 'or', 'if then', etc., but also the negation 'not' in its meaning 'it is not the case that…' has to be included here. In Logic, the meaning of these expressions is explained as follows: The negation sign is a functional expression that has just one expression for a sentence going with it, like in: 'It is not the case that Paris is the capital of Germany'. It is explained as: the complex sentence 'non a' is true if and only if the component sentence 'a' is false, and vice versa. All the other logical connectives are defined in such a way that it is stipulated that the truth of the complex sentence (for example 'a or b') should depend *only* on the truth of its components. So in the case of the inclusive 'or' it is stipulated that the sentence 'a or b' is true if at least one of the components is true, in all other cases it is false. Compared to the meaning of some of these connectives in ordinary language this is a restriction. But Frege makes it clear that it is exactly *this* restriction that for him defines the *logical* sense of the connectives. Their meaning is *truth fuctional*, i.e. the truth of a complex expression of the form 'a connective b' (a * b) depends *only* on the truth of the components 'a' and 'b' and the chosen connective.

When we pause here for a moment, we can see that in these few steps we have built a language with the help of which we can express quite a lot of types of content. We can name objects, we can predicate something of them and thereby form sentences that can be true or false, we can express relations between objects. We can express general statements like 'all men are mortal', and I can add here that we can *define* on this basis the so-called 'existential quantifier' by using the universal one and negation. Also we can form complex sentences like 'x is P or x is Q'.

On this basis we can do logical deductions. For example: From the cited definition of the meanings of the signs it follows that if the complex sentence 'x is P or x is Q' is true, and if also 'it is not the case that x is Q' is true, it follows that 'x is P' is true. This follows from the meanings given to the logical signs, regardless of the particular contents of the words that can be put in at the places indicated by the letters 'x', 'P', and 'Q'. One can express this by saying that for such a deduction only the *categories* of the expressions used are important (this is why it was enough to write down letters, not real words), and instead of 'categories' one can also say 'forms'. But it is important to notice that this understanding of 'forms' or 'categories' is still based on content, namely on the kind of function that an expression of the relevant category has in a sentence.

It is also worth mentioning that every sentence, simple or complex, can be taken as a component of a still more complex sentence (like in '(a or b) and not b'), so that there is no upper limit as to the length of sentences. This has the consequence that if we are interested in logical deductions, things can get quite complicated. But at the same time this type of complication does not involve any vagueness or ambiguity. Frege's two maxims 'nothing implicit!' and 'nothing ambiguous!' are strictly obeyed.

3. The 'formal' point of view; 'syntax'

I now turn to a special understanding of the word 'formal' in expressions like 'formal logic' and 'formal language'. In Frege, the word 'formal' is a *matter of treating* logic or a language like his concept script, it does not designate a special area of objects. This will be of importance when we later ask what it means to say, for example, that syntax is something *formal*, or that in natural languages syntax can or should be treated in a *formal* way. Such a claim can mean that the field of language studies that treats the formation of sentences with the help of words has to speak of *forms of expressions*. Understood in this way, this claim is certainly true. In the indicated context we have, for example, to speak of the forms of the verbs and the inflexion of nouns. But to speak of forms in this sense does not necessarily mean that in so speaking, all aspects of content are excluded. On the contrary, when, for example, it is stated that a certain occurrence of a genitive form indicates possession, this is a remark about the content of this form at this occurrence.

So our question must be: What is the special kind of treatment that Frege can employ in using his concept script that we call a *formal treatment*? Here we must remember the two maxims he set up for his concept script: Nothing in it should be ambiguous, and nothing should be left implicit, should be left to guesswork. In other words: All content (especially as kinds of signs and ways of combining them are concerned) should be expressed in the visible design of the signs of his concept script. The motive Frege had for putting up these maxims was that in his field of Mathematics he often found in the writings of his colleagues argumentations that showed gaps. In the case of an attempted proof, for example, it would sometimes not really be valid as it stands, but would require from the reader some additional thoughts, additional premises, that the author had not really written down but that an intelligent reader would add, often without being explicitly aware of it. In this sense the reader would supply additional, 'implicit' elements to the proof (or would opt for one of two possible readings), which is good and fine as long as things go smoothly. But strictly speaking such a proof is defective in that it depends on additional work that the reader has to provide. And if matters get complicated and controversial, it would obviously be an advantage if we had a means of expression that *spells out* all the meaning aspects that are relevant for the proof. And since, as I have explained, a sensible reader of the proof (or a sensible conversation partner in Philosophy) sees and understands cases of ambiguity and of implicitness when they occur, the demand seems reasonable to exclude these with help of the designs of the signs. And this is what Frege set out to do when he developed his concept script.

And now we can take the decisive step for understanding what a 'formal treatment' of language can mean. First we look at the question of how meaningful sentences of his concept script should be formed. Normally, in natural languages, we decide this by looking at what we want to say, looking of the content we wish to convey. But if indeed, (in order to exclude implicitness and ambiguity), all matters relevant to the kind of content we wish to express can be read off from the visible design-elements of the respective concept script expression, then it must be possible to treat the rules for constructing such expressions in a way that does *not* mention their content. Why do we not have to mention the content in deciding about the correct form of our sentence? It is

because we have constructed the concept script in such a way, that all relevant differences in content structure show in differences the design of the signs.

And if our subject matter is Logic, i.e. deductive relations between sentences in which truth is preserved on the basis just of the categories of the parts of the sentences concerned (as I had explained in my simple example), and if these categories can be read of from the sign designs, then also this subject matter can be treated in a formal manner, and this now means it can be treated by looking at the sign designs only. And since Frege thought that Mathematics is a special field of Logic, the same seemed true for him for the content side of Mathematics. So in the field of Logic the possibility of a 'formal treatment' does not stop at the level of single sentences and their correct forms, it goes on to a formal treatment of the *content* of Logic (and, if Frege is right, of Mathematics), namely as a system of sentences and their deductive relations. Frege was the first to formulate such a logical system or 'logical calculus'. So it is not that Frege is not interested in content any more. It is only that he has designed a method to treat content in such a way that he can stick to the forms (to the sign designs) alone. But let me repeat: This is not where he started. Many of his philosophical reflections are concerned with questions like: What are numbers? What structures are the logical ones? What kinds of categories must a concept script provide? Such questions must have been answered, and only on the basis of such answers a formal treatment of the field of logical deduction is possible.

I will now take a look at a simple example, namely the propositional calculus, to give those of you who are not familiar with Formal Logic and Analytical Philosophy an impression of what is at stake here. This is necessary if we later want to be able to pass a judgment on the question what this means for understanding natural languages and developing a 'theory of meaning' that is not a 'microscope theory' but fits to what we indeed do when we speak a natural language. So what does a 'formal treatment' of the logic of propositions involve?

As I had mentioned, 'formal treatment' in the special sense made possible by Frege means that we behave *as if* we were looking at rules for putting together strings of marks that are *devoid of meaning*. Of course we know that our final goal is to understand logical relations between sentences that have content. But we pretend (for the methodological reasons I have explained) that we do not know this. We look at the rules for producing these strings of marks as if we were children playing a game like 'Dominoes', in which the strings produced have no meaning except that they fulfill or violate the rules of the game. We can also say that we look at the strings like an alien from Mars would look at them who is intelligent enough to see their different designs but who cannot understand the kind of language we have. And instead of a person from Mars you could also think of a machine that can *discriminate* between differences in the *designs* of figures drawn on paper, but cannot understand a language.

With these preliminaries we can see that we need the following steps when our goal is to treat the logic of propositions like the game of Dominoes. First we have to provide a complete list of the simple building blocks out of which the chains we are going to produce will consist. In our case these will be (firstly) the lower case letters, a, b, c, … etc., which (when we later give up our formal perspective) represent single sentences. Secondly we have to list the symbols that can go between two symbols for propositions, i.e. to list the logical connectives we intend to use, let us say 'not', 'and', 'or' and 'if-then'.

In order to build really long concatenations, we should also have brackets to indicate how the connectives relate to the sentences that are their neighbors.

In a second step, when we have all the building blocks we need, we must (again like in the game of 'Dominoes') formulate some rules that will regulate how these blocks can be put together. Here again what guides us is the use we want to make of all these provisions in the end, we want to discuss logical relations between sentences. In view of this goal, only some of the sequences of symbols will count as 'well formed'. So although it is possible to lay down with our Dominoes-blocks the sequence 'a) and or', it does not make sense to allow this if we aim at *sentences* in the end. So we will say, for example, that any two symbols for sentences 'a' and 'b' can be taken to form the complex 'a or b', so the complex counts as 'well formed'. The same is true when we take any well formed expression and prefix it with the negation sign, giving, for example: 'not (a and b)'. Please note that such rules can be applied repeatedly, i.e. they can be applied to the results of former rule applications. Such rules are called '*recursive* rules', and it is easy to see that in this way endlessly many concatenations can be produced, like when we start with 'a', proceed to 'a or b', proceed to 'not (a or b)', proceed to 'not (a or b) or c', etc., etc. This shows how we can use a small number of elements to produce indefinitely many expressions, and I will later ask the question how this 'recursiveness' of the rules in logical systems relates to what we call the 'creativity' of natural languages.

In a third step, finally, we can formally define what sequences of well-formed formulas count as proofs. I had mentioned above that from 'a or b' and 'not a' we can (on the basis of our stipulations for the meanings of the signs 'or' and 'not') deduce that 'b' must be the case. We can write out this relation in the form of one complex sentence and say that the complex sentence 'if ((a or b) and (not a)) then b' is logically true. So here you see how it is possible to treat a particular content (logical truth) in a way that a person or a machine can handle on the basis of discriminating sign designs only, without *understanding* any meanings, neither of the signs that can stand for objects or attributes, nor of the signs that can stand for sentences. This is the basis of all information processing. And I hope my discussion makes it clear that we can safely say: A computer does not *understand* the expressions it is processing. Only the person working with it does.

4. A comparison of Frege and Wittgenstein

For our purposes, these few hints must suffice to give you an idea of the sense in which Frege's concept script not only is a precondition for automatic language processing, but also how it can be an inspiration for looking at what we do in using our *natural* languages in the context of argumentation. For example, Rudolf Carnap has reported in his Intellectual Autobiography that when in situations of complicated philosophical debates he would fear to loose sight of the state that had been reached in the exchange of arguments, he would write down what has been said in a logical notation and would immediately come to grips with it. This is quite plausible in certain contexts. We can also see how Frege's concept script can be perceived as a model for an attempt to understand the semantics of natural language, since his formal system (with a few additions that Alfred Tarski later proposed) seems to be able to tell us the meanings of indefinitely many sentences that it allows to generate recursively. Therefore it can inspire a proposal concerning how the 'semantically relevant structure' of expressions of a

natural language should be viewed, because it shows what it means to classify words according to their functions in the sentence: Names *name* a particular entity; concept- and relation-expressions *classify* the entities, i.e. they say that a certain predicate is true of them or that they stand in a certain relation, and since they are 'unsaturated' they at the same time explain the unity of the sentence. Furthermore, logical connectives enable us to combine component sentences to form a complex sentence the truth of which depends solely on the truth of its constituents. And quantifiers express 'second order concepts' in that they speak about the results of substitutions in sentences containing a space left open for a name. Accordingly, in Frege's concept script we are offered a general understanding of the sense in which we can 'infer' the meaning of a new sentence from the meanings of the constituent words and from the (semantically relevant, i.e. 'logical') structure of the sentence. That the meaning of a sentence is found in such a way has later been called the 'Frege-principle': We can 'infer' the meaning of a new sentence from the meanings of the constituent words and from the (semantically relevant, i.e. 'logical') structure of the sentence. In Frege's Logic, this 'inferring' can be seen as a kind of 'calculating' in a rather strict sense: When we know the meanings of the words and the meaning of the structure-building devices we can 'arrive at' the meaning of a sentence we have never heard before, in a quite strict way that is unambiguously determined by the categories of the expressions. Something like this also seems to be true for natural languages: The verb forms and the inclination of nouns seem to be subject of strict rules. Also the meanings of sentence structures seem to underlie clear rules in some cases, if we think, for examples of a sentence like 'Paul loves Mary' as compared to 'Mary loves Paul'.

It is remarkable that in Frege's concept script we find a rather limited number of kinds of expression that seem to be able to express a huge number of (or even 'all') true thoughts as soon as the meanings of the single words have been defined. We also find that on the lowest level of the realm of 'thoughts' (i.e. where we are concerned with truth and stay at the level beneath truth functional combination and quantification) there is just *one* single way of building complexes: All complex expressions on this lowest level say that an object falls under a concept (or that a plurality of objects stand in a relation). This 'economy of means' is also an aspect that makes it promising to try to adopt Frege's results for looking at natural languages. Indeed, Michael Dummett went so far as to claim that we would be completely unable to understand our linguistic competence if we would not have Frege's account of language structure.

In order to be able to assess such claims, I now want to take a second look at the method Frege uses to determine the 'elements of meaning' and the ways in which they can be combined in order to form an expression that can be true or false. How does he *find out* what the hidden elements of meaning are, and how they can combine to form complexes that we do *understand*, but that we cannot (in natural languages) simply read off from the design of the respective signs, i.e. from the words as they are written down or printed? We noted above that what we *normally* do (and what Frege is doing in his writings) when we have to resolve an ambiguity (or are in some other way confronted with the necessity to clarify what we had expressed) is to formulate *comments* and *paraphrases*, i.e. we clarify language with the help of language. On what does this ability to comment and to give paraphrases rest?

It is very tempting to use the following picture when we want to understand how this is possible, and it seems to me that this picture captures something of the way in which

Frege was actually thinking. Since, in natural language, we cannot detect the relevant meaning-aspects as something exhibited by the 'mere sign', but we find that we can still grasp and explain these hidden aspects to someone else, we look for something *behind* the sign, something that we traditionally call its 'meaning'. So we are led to the answer that the logician has to look in the realm of meaning (or, using Frege's technical term, he has to look in the realm of 'sense') in order to find the logically relevant structures. There seems to be a structured realm of content *behind* any given linguistic expression. Every competent speaker seems to 'see' it with her 'inner eye'. She can move freely in it, for example when she tries to find helpful paraphrases. With respect to complete sentences, Frege here speaks of a realm of 'thoughts' (in an objective or 'platonic', not in a psychological sense) and what he is after when he is developing his 'concept script' is to follow the structure of the respective 'thoughts' in the closest possible way. The 'logical structure of language' then would be something *behind* or *above* language, something by which a philosopher of language is guided when she discusses the semantic structure of utterances formulated in a natural language.

It is interesting to see that Wittgenstein explicitly addresses this guiding picture in the following words: "The strict and clear rules for the logical construction of a proposition appear to us as something in the background – hidden in the medium of understanding. I already see them (even though through a medium), for I do understand the sign, I mean something by it." (PI § 102)

But, as Wittgenstein has shown in his *Philosophical Investigations*, there is no reality 'behind' or 'above' language in the sense of a language-independent world of thought or an invisible mechanism of 'meaning something', so construed out of elements that the combinatorial possibilities determine the permissible combinations of words. Furthermore, it turns out that, in the realm of sense, one cannot speak of wholes and their parts, to be mirrored by the wholes and parts of a sentence formulated in a concept script. The part/whole relationship holds, when it holds at all, only on the level of expressions, as Frege himself acknowledges. But he did more than that: In his later years he expressed some doubt about a logical world *behind* language. Indeed, Frege gives a hint that it is not to a language-independent realm *behind* the sign, but rather to the '*use* as a sign' that we must look in order to detect the logical role of any given expression. Frege here speaks like the later Wittgenstein; the German wording is "Gebrauchsweise als Zeichen, das einen Sinn ausdrücken soll". (The use of a sign that is meant to express a sense.) So we find formulated by Frege an idea that is usually only attributed to the later Wittgenstein: It is the *use* of a sign, its function in the act of communication and its function in the sentence that determines its logical classification as a sign of a particular logical type. So the use of signs is what the logician must study in order to get the information he needs for the construction of a logical language.

When we now turn to an explicit comparison of Frege's main ideas with the philosophy of the later Wittgenstein, we should note that both Wittgenstein's methods and his goals differ markedly in important respects from those of Frege. Two such differences are of special importance for us: First, Wittgenstein does not restrict his remarks to those aspects of language, which are relevant to truth and logical deduction. He has neither the language of science nor that of mathematics in mind as the privileged area to which his considerations apply, and it is not his goal to propose a 'concept-script' that would better serve scientific purposes than does our natural language. This often leads him to develop his arguments using 'primitive' forms of language that he has created for the

purpose of clarifying his thoughts. They are so constructed that an instance of using them often cannot be described as the passing of a judgment. So Wittgenstein has in mind right from the start uses of language that are neither statements of propositions nor parts of such statements.

Second: In contrast to Frege's method of breaking down or 'analyzing' the necessarily complex expression of a judgeable content, Wittgenstein chooses *simple* expressions as his starting point, and only then proceeds to the fact which is essential to linguistic competency, namely that there are various ways of expanding these simple expressions through the introduction of other linguistic elements. In this sense his procedure in the later philosophy, insofar as it concerns the first steps toward the clarification of linguistic complexity, is 'synthetic', and not, like Frege's method, analytic. Both of these circumstances have the result that in Wittgenstein we find much more diversity among the kinds of language use than in Frege.

But they have enough in common, I think, that it makes sense to raise the following question: Could not Wittgenstein's view of language be read as *supplementing* Frege's? One could expect him to approach the meaning aspect of *natural languages* along the following lines: by way of creating simple 'language games' Wittgenstein can be expected firstly to show his readers how a word appearing individually is applied, i.e. a word the use of which is closely interwoven with extra-linguistic actions but that, as far as their *linguistic* surroundings are concerned, can occur without any surrounding verbal text. One could then expect Wittgenstein, again in Fregean terms, to make a second step in which he would discuss ways of expanding these types of language games (i.e. those that use independent or 'saturated' expressions) in order to make understandable the use of newly added 'unsaturated' expressions of various categories.

So in the second step we expect from Wittgenstein that the use of such 'dependent' words (i.e. words that cannot appear without a *linguistic* context) would be explained. Words of this kind are necessarily related to other expressions that are already mastered, words that also occur in the situation of use under consideration, but are modified in their meaning by the newly added expressions. These expansions should make the possibility of semantic complexity intelligible to us: that is to say, the difference between a complex expression with a unified sentential character on one side, and a succession of various utterances tied together only by their proximity in time, on the other. Such expectations about Wittgenstein's later philosophy seem to be confirmed in the following passage from the *Blue Book*:

"I shall in the future again and again draw your attention to what I shall call language games. These are ways of using signs simpler than those in which we use the signs of our highly complicated everyday language… If we want to study the problems of truth and falsehood, of the agreement and disagreement of propositions with reality, of the nature of assertion, assumption, and question, we shall with great advantage look at primitive forms of language in which these forms of thinking appear without the confusing background of highly complicated processes of thought. When we look at such simple forms of language the mental mist which seems to enshroud our ordinary use of language disappears. We see activities, reactions which are clear-cut and transparent. On the other hand we recognize in these simple processes forms of language not separated by a break from our more complicated ones. We see that we can build up the

more complicated forms from the primitive ones by gradually adding new forms." (p. 17.)

The last statement is of particular importance to us: does Wittgenstein claim that we can obtain the complex forms of *our* language through a step-by-step expansion of simple 'language games', by adding new forms? Could we arrive in this way at an extended version of Frege's 'concept script' the syntactic forms of which would explicitly and clearly reflect the respective content-relationships, — or would we discover hindrances that stand in the way of such a project?

For those who have not heard my last lecture on Wittgenstein I must at this point mention the most important single insight that separates his later from his own earlier way of thinking as well as from the picture of a concept script as drawn by Frege. It is what I have described as a 'Copernican revolution', a turning around of the direction of projection in his understanding of linguistic structure. The later Wittgenstein no longer thinks that something given, like a 'structure of the world' or the 'structure of thought' determines the structure of logic and language. Instead it is language that determines what structure is used for making linguistically accessible more and more areas of what in its totality we then call 'the world'. In this process metaphorical movements of projection occur. Comparable to a case in which we use one lexical item like 'virus' to talk about something else ('computer virus'), in language (and in Logic, Frege claims) we are using one syntactical means (like the actor-action scheme) to talk about things that are not actions and do not involve actors (like in 'the fighting stopped'). Here is the point at which Wittgenstein indeed cannot follow Michael Dummetts project for a theory of meaning: Because of the phenomenon of 'syntactic metaphor' we indeed cannot in any strict sense *derive* the meaning of a sentence from the meaning of its constituents and the structure of the sentence, in natural language. But contrary to what Dummett was afraid of, this does not imply that we learn the meanings of our natural language sentences one by one. It only means that the capacity to make metaphorical moves is a substantial part of our linguistic competence. And in this respect, the human language capacity is fundamentally different from capacities that machines can have.

5. What is a theory of meaning?

So what does all this mean for the project for a theory of meaning for natural languages? In trying to answer this question, we enter into contested territory and encounter deeply opposed and passionately defended philosophical stances. It is therefore advisable to exercise extra care in considering what exactly the phrase 'theory of meaning' can mean.

As a first step towards such clarification, we should, at this point, explicitly acknowledge that a *naturalistic* understanding of such a theory – i.e. understanding such a theory as aspiring to give a scientific account of the emergence of *meaningful* (and especially linguistic) behaviour out of forms of non-meaningful, non-intentional behaviour or, alternatively, out of 'representational processes' in the brain – does not fall within the scope of topics Frege as well as Wittgenstein have been discussing. Consequently, I am not addressing it in these lectures. Now this does not, in itself, mean that the naturalistic question is uninteresting, or that we are presently in a position to formulate *a priori* grounds, which could guarantee that a convincing answer cannot be found. Whether or

not this question can be answered will, of course, depend on our concept of naturalism, among other things. But this topic is simply foreign to Frege's and Wittgenstein's ways of thinking and is therefore a subject about which I have nothing to contribute here. Stated positively, this means that when I speak in what follows about the project of a 'theory of meaning' I will remain within the *philosophical* domain, which here means the domain of clarifying an intentional activity by reflecting on it.

But, turning to Wittgenstein, does his thinking even allow for the possibility of *philosophical* 'theories'? Would he not regard the very expression 'philosophical theory' a contradiction in terms? For example we read in his *Philosophical Investigations* not only: "It was correct that our considerations must not be scientific ones", but also: "And we may not advance any kind of theory." (§109) Has he not repeatedly stated that the task of philosophy is not formulate and test hypotheses, but rather to state what should be obvious, but what in fact is so close to our eyes that we are unable to see it? (§§89, 92)

These questions reveal the need for further distinctions among possible readings of the phrase 'theory of meaning', even after naturalist readings are excluded. It is certainly correct to say that at no point in Wittgenstein's extended and persistent efforts to clarify the many shades of a family of concepts connected with 'meaning' is his procedure to postulate a realm of entities hidden from our view, to speculate about the relations they might have to one another, and to interpret on this basis what happens in the observable world of speech. In contrast to what he takes Frege to have done in developing his ideas about *Sinn* and *Bedeutung* and in applying these ideas in a systematic way to proper names, predicate expressions, and sentences, Wittgenstein explicitly refuses to acknowledge a realm of 'meaning-entities' that would be located 'behind' our linguistic utterances. He is sceptical about a Fregean 'world of thoughts' to which we should direct our attention when we want to discover the 'logical form' of a given expression – a form taken by Frege to be hidden under its visible or audible surface. So if the phrase 'theory of meaning' is supposed to actually have a sense, and if that sense is supposed to be compatible with the central tenets of Wittgenstein's later reflections about the nature of philosophy, it cannot refer to the sort of 'philosophical' theory which aims to explain something observable by recourse to something hidden. So far, then, we have two negative claims: (1) Wittgenstein's later work is not concerned with developing a *scientific* theory about the emergence of meaning out of some state of affairs devoid of meaning, and (2) in his attempts to clarify what meaning is, Wittgenstein remains within the *philosophical* realm. For him this means that he is engaged in a reflection on our own activities, a reflection that we are able to pursue without any kind of (scientific or philosophical) 'theory' about hidden entities 'behind' language.

But this is not to deny that language itself does have a systematic side (it is like a calculus in certain respects – in containing *kinds* of words, for example) and that to understand and to spell out the (limited but existent) functioning of this *systematic* side of language requires some effort and is a prerequisite for understanding its other side, the side requiring imagination, requiring the competence to invent and understand metaphors. And if we want to call the results of such elucidatory efforts a 'theory' (which Wittgenstein himself would have refused to do, to be sure), this would only mean an account of language that (among other things) makes it perspicuous how the mentioned systematic aspects of language function as well as where their limits are and why we have to expect that philosophical questions of the kind Wittgenstein is treating will

continue to arise. The acknowledgement of the mentioned limits does not involve denying the existence of the systematic (or 'calculus') side, nor does it overestimate it by suggesting it comprehends something like a postulated 'whole of linguistic meaning' – even if such a whole is understood in the strict and narrow sense of Frege's *Sinn*, i.e. as excluding the additional areas that depend on particularities of the respective situations of language use and that Michael Dummett has called the 'force' and 'point' of an utterance.

To walk such a bipartisan line is not easy, because in natural languages, the aspects of 'calculation' (Frege principle) and 'imagination' (metaphor) interact in intricate ways. It is therefore quite natural for one to fall into one of two traps: by overstating either the calculus side (as authors who take their orientation from Frege tend to do) or the side of imagination (a tendency found in some so-called 'quietists' who seem to deny that there are *any* systematic aspects to the semantics of natural languages). What I have tried to show here and in my last lecture is that Wittgenstein provides an account that does justice to both these aspects, and (most importantly) that this account sheds light on the ways they interact. The ability to speak and understand a natural language is not the ability to operate a calculus; the *description* of this ability therefore cannot be a formulation of the rules of such a calculus; and for the same reason it cannot take the form of an axiomatic-deductive theory. But to say this is not to deny that we *can* distinguish parts of speech or that we *can* write grammar books for non-native speakers – books that make use of such distinctions in formulating rules as instruments to facilitate language learning. A proper grasp of grammatical categories and relations does play a role in one's understanding an utterance, and in this sense there is a formal side to language – even if an appreciation of this formal side frequently does not suffice for a speaker to so much as grasp the meaning of an utterance, in the sense of Frege's 'thought'.

So we must also recognize the other side. We can stress with Wittgenstein that, in order to acquire even the first steps of an extremely simple sign system (like the famous language game of the builders) it is necessary for one to have (in Robert Brandom's terminology) a 'hermeneutic' understanding of the situation on the building site. The language learner has to grasp what is going on in the sort of social setting where a number of people are collectively engaged in a goal-oriented activity. When this language game (in the context of Wittgenstein's fictitious tale) is later extended in such a way that the speakers can make use of structured utterances consisting of several words, the 'calculus' aspect of language emerges and with it what Brandom calls an 'algebraic' competence of the speaker: the language learner has to get the forms right. She has to see, for example, that 'five slabs' has the same structure as (i.e. functions in a way analogous to) 'seven columns', and she must also appreciate the structural difference between 'five slabs' and 'green slabs'.

But even the ability to 'get the forms right' is not the sort of competence that a speaker would have when she would have mastered a formal method that would enable her to grasp a phantasized totality ('the whole') of what is linguistically meaningful. It is one of Wittgenstein's most important contributions to have directed our attention to the fact that, in natural languages, grammatical forms are continually *projected* into ever new fields of activities. Consequently, analogies of the kind mentioned can become stretched to such a point that we may want to say that the structural meanings themselves have changed. As I have noted, this change is comparable to the kind of change that takes

place in the case of metaphor – confirming the aptness of Eric Stenius's phrase 'syntactic metaphor'. To be able to grasp the meaning of such a projection, the hearer must once again possess a sort of hermeneutic understanding. She must understand how to make sense of a projection – to understand (correctly guess) the sense in a projection – despite the fact that it is, strictly speaking, a case of 'misuse'. The meanings of such projections cannot be arrived at by calculation. Instead, projections open linguistic possibilities that lie beyond the scope of any rules that might have been stated up to that point. And this shows that the very idea of a 'totality of meaning' is deeply misguided for natural languages, although it does make sense in a restricted area like the propositional calculus. To see that and why it is misguided for natural languages is of great philosophical (and especially, I think, of epistemological) importance.

We can therefore say that the results of the *algebraic* competence displayed in getting the forms right are used in later steps of making new projections, the meanings of which have then to be understood *hermeneutically*. And this third level of understanding cannot in turn be captured by algebraic means in a once-and-for-all fashion. Any structure that might be developed can (in a 'living' language) itself be projected once again, thus once more opening up new possibilities. Therefore (and this is where the account given here might diverge from the one formulated by Brandom) the hermeneutic mode of understanding not only has a place at the base of language, but also at the highest levels of linguistic competence. It is this dialectical movement – from the hermeneutic or 'imagination' side of language to its algebraic or 'calculus' side, which then continues (on a higher level) to another 'imaginative' step – that *explains* the discrepancies between grammatical and semantic structure that thinkers like Frege had observed when they began their work. To understand and possibly remedy those discrepancies motivated many philosophers and linguists, for example they have led the linguist Noam Chomsky to opt for a purely formal understanding of syntax. It is also this unavoidable difference between 'surface' and 'deep' structure that has led Wittgenstein to his claim that any fixation of a particular logical structure that would (for example by philosophers like Russell or Carnap) be taken as exhibiting a (or even 'the only') "fully developed language" would lead to "injustices", it would promote one structure to a superior rank without a philosophical justification.

Can the kind of reflection on language undertaken here be of epistemological relevance, as the founders of Analytic Philosophy claimed? Some commentators have pleaded that we give up this idea. Richard Rorty, for example, has defended what he has called a 'pure' philosophy of language, in the sense that it should steer clear of epistemology and just treat the workings of language as philosophers like Gottlob Frege and Donald Davidson have done. In a different but related way, other authors (notably John McDowell in a controversy with Michael Dummett) have claimed that the most we can reasonable aspire to is a 'modest', understanding (or theory) of meaning. The term 'modest' here is intended to mean 'without epistemological relevance'. Dummett speaks against this kind of modesty when he say that we should not try to explain *linguistic* meaning by recourse to *psychological* meaning, i.e. by recourse to mental entities and events, because this would involve a circular argument: A 'modest' theory of meaning in Dummett's sense is one which refuses to say what a speaker's knowledge of the meaning of a word or phrase consists in, apart from saying that she is in command of a related underlying 'concept'. And what this in turn means is not explained in a modest theory, which for this reason cannot be of any help in normative epistemological discussions. Opposing this kind of modesty, Dummett has (rightly, I think) insisted that we need a

more robust philosophical account here. A philosophical account of language should be epistemologically relevant, i.e. it should help us in the particular case to distinguish meaningful statements from those that are not meaningful, i.e. from utterances for which the speaker has not succeeded in making clear what sense they are meant to have. In order to accomplish this distinction, we *should* be able to say what a speaker's knowledge of the meaning of a word or phrase consists in, how it shows. Dummett thinks that a legitimate account of the meaning side of language is not entitled to help itself to a semantic terminology from another field, like (scientific or 'folk'-) *psychology*. Especially talk of 'concepts' needs a philosophical clarification and cannot be taken for granted. If we would stop short here we would be captured in a viscious circle of the kind we find in early Empiricism. As is well known, Wittgenstein opens his *Philosophical Investigations* with a criticism of this kind of recourse to 'mental entities'; in his case it is St. Augustine's version of such a (as it were) 'reduplication' theory of meaning.

If the very phrase 'theory of meaning' is meant to imply a philosophical project that aspires to epistemological relevance by presuming to legislate over a purportedly surveyable 'realm of the meaningful' by once and for all characterizing all the kinds of admissible expressions and all their admissible combinations (as for example the early Carnap had envisaged), then our reading of Wittgenstein has led us to agree with those who are convinced that *this* goal is misconceived. There is no 'realm of meaning' that could be characterized once and for all in its totality, and certainly epistemological theories about the forming of all knowledge on the basis of 'sense data' are hopelessly unconvincing and are not at all something that the later work of Wittgenstein would be compatible with.

Let us then ask whether Wittgenstein's account of natural language, is or is not of epistemological relevance. Can it be of help in critical reflections about purported insights and explanations? The answer that emerges from our discussions is clearly affirmative. Although anyone who has understood the process or activity of projection as explained in the last lecture and briefly mentioned in this, will see that it is an illusion to speak of a surveyable realm of the meaningful or to imagine that this realm could ever be circumscribed by means of rules which could function as a basis for epistemological legislation, this in no way vitiates the fact that Wittgenstein's account of meaning is (and is meant to be) of the highest epistemological relevance in many of the particular cases he discusses. He corrects mistakes; he destroys illusions about non-existent foundations and pseudo-explanations, perhaps most strikingly in the case of his so-called 'Philosophy of Psychology'. In this area we can also see how he avoids circularity exactly by refusing to take psychological concepts for granted. So the account of meaning he offers is not 'pure' because it is of epistemological relevance, and it is (on Dummett's understanding of these words) not modest but 'full blooded', since it has something to say about what the understanding of a linguistic expression consists in, without recourse to unexamined mental entities like 'concepts', but with recourse to what he has called 'language games'.

The epistemological relevance of Wittgenstein's work and his opposition to 'dismissive quietism' is sometimes underestimated because it is not always fully appreciated that his investigations are *normative*. Unfortunately, he himself has contributed to this misunderstanding that all he has to say is purely descriptive. For example, he writes that philosophy "leaves everything as it is" (§124), and "Philosophy just puts everything before us, and neither explains nor deduces anything." (§126) But we should not read

such sentences in isolation. To do so would be to neglect his important distinction between those contexts in which language *works* and those contexts in which it "*goes on holiday*". (§38) Only where language *works* can we 'leave it as it is'. And much of the energy that a philosopher working in Wittgenstein's spirit has to invest goes into determining on which side of this divide a particular usage of language belongs: is it a case in which language *works* or in which it *goes on holiday*? Wittgenstein also explicitly states this normative interest when he says he would "rectify mistakes".

From the above considerations we can conclude that what is perhaps most commonly called a 'theory of meaning' today (i.e. one in a robust sense of 'theory' *not* exemplified in Wittgenstein's work) will in most cases be 'pure' in Rorty's sense (i.e. it will have no direct epistemological concerns) and can (in Dummett's sense) only be a *modest* one, since it does not explain what 'being in command of a concept' consists in. It typically treats a logical system of the kind developed by Frege as a point of comparison to shed light on some aspects of natural languages. Aspects of language that might be brought into focus by such a comparison are those that we have here called the 'calculus' side of language (the side to which our 'algebraic understanding' applies). From the considerations set forth here we can see that such a theory will concern itself with what Wittgenstein calls 'surface grammar', i.e. with similarities among expressions that can be 'captured with the ear'. It is clear that this level does not suffice to decide epistemological questions.

If, on the other hand, our topic is 'Wittgenstein's account of meaning', our reading of his texts clearly indicates that what he is doing cannot be classified as 'modest' in Dummett's sense, but must be termed 'full blooded': It does not take psychological entities like 'concepts' for granted but (in speaking about the mastery of 'language games') gives an account of what the 'knowledge of a concept' consists in. Furthermore, it makes perspicuous what the mastery of complex forms of expression consists in by (among other things) offering genealogical accounts, i.e. by "… finding and inventing *intermediate links*." (§122; Wittgenstein's emphasis) Without recourse to 'psychological entities' (which would introduce the danger of circularity by speaking of 'inner semantic' processes in order to explain the linguistic activities), Wittgenstein is able to show what the mastery of simple expressions consists in and what steps are involved in their expansion. Here it is important to note that his genealogical stories (as he explicitly states) are not meant to lead to an imagined 'whole', a complete 'realm of the meaningful'. Such an attempt, he said, will "only lead to injustices". Instead, he is aiming to achieve what he calls "surveyability" or an "overview" (§ 122) of areas of linguistic usage, which, although restricted, nevertheless exhibit systematic relations whose workings are characteristic of the functioning of natural languages. So his treatment of meaning is normative and, by being so, of the greatest epistemological relevance; it helps us to distinguish cases in which we 'said and meant something' from cases in which we only 'said something', but in which a careful and often lengthy activity of reflection reveals that (despite appearances) we failed to mean anything. In this respect, his account is not 'pure' in Rorty's sense.

So we can ask: Does Wittgenstein propose a theory of meaning? My own answer is this: we at least find a highly relevant contribution to the issue of what we could possibly mean by the phrase 'theory of meaning'. My message for the *modest quietists* of different schools is (among other things) that there is more to learn about the systematic, the calculus side of language in Wittgenstein's writings than some of them seem to think. It

seems to me worthwhile to understand in detail why this side of language exists, but can cover so little ground, why the calculus picture must fail if it is taken as a guiding picture in the endeavour to understand all of the basic workings of natural languages. As we have seen, this understanding involves some extended reflections and, regardless of whether one chooses to call these reflections a 'theory', Wittgenstein's work shows at length how we can proceed here without circularity. I am aware that some readers (on the 'quietist' side in its not dismissive version), even if they accept what has been worked out in this book, (and that certainly Wittgenstein himself) would prefer not to speak of a 'theory' here.

My message for the defenders of a *calculus type* of theory is that the close reading as exercised here shows in detail that and why a theory of meaning of the sort Dummett has envisaged cannot be realized, but that this does not force on us the admittedly absurd conclusion that we learn the sentences of our native languages one by one. To find the way out of Dummett's impasse ('Frege or no serious philosophical treatment of meaning at all') one must recognize that (even in the domain of Frege's *Sinn*) we have to rely on two kinds of human understanding: the hermeneutic ability to understand situations ('imagination') and the algebraic ability to get the forms right ('calculation'). If we are willing to follow Wittgenstein in adopting a diachronic perspective, i.e. one that takes into account that (ontogenetically and phylogenetically) our linguistic competence has evolved in time, then we can see that these two types of understanding have to be understood as constantly interacting, and that in the course of these interactions it is the hermeneutic side that has the last word.

So we see that it takes some prolonged effort to formulate and argue for such a picture of language. And it may well be the case that some philosophers would not hesitate to call this kind of work the construction of a 'theory'. For those who do, my question gets an affirmative answer. In Wittgenstein's later work, we indeed find a 'theory of meaning' in this broad sense: we get a substantial, systematic, and detailed picture of the workings of natural language and of the *kind* of competence that is involved in mastering it. Wittgenstein himself surely was no 'dismissive quietist'. But at the same time, he shows us that and why we cannot hope to develop a theory of meaning in the strict sense of an axiomatic-deductive system. This is why for readers who follow Wittgenstein's stricter use of the term 'theory', the answer will be negative: Wittgenstein's later work does not offer any building blocks for an axiomatic-deductive theory of meaning. Personally I do not want to quarrel about words; I hope to have shown that Wittgenstein has important and as yet underappreciated contributions to offer both sides.

In the aphoristic writings of the German dramatist Heinrich von Kleist we find the following remark: "One could distinguish two classes of people, on the one hand there are those who are at home with metaphors, on the other are those at home with formulas. Those at home in both areas are very few; they do not form a class." I think we should try to increase the number of people who are at home on both sides.