a universal word are held by Wittgenstein to be nonsense, because he does not consider the correct formulation of syntactical sentences to be possible.

*The use of universal words in questions* in connection with one of the w... interrogatives ('what', 'who', 'where', 'which', etc.) is akin to their use in universal and existential sentences. Here also, in translation into a symbolic language, the universal word determines the choice of the kind of variable. A yes-or-no question demands either the affirmation or the denial of a certain sentence $\mathfrak{S}_1$, that is to say, the assertion of either $\mathfrak{S}_1$ or $\sim\mathfrak{S}_1$. [*Example:* The question "Is the table round?" requires us to assert in answer either: "the table is round" or: "the table is not round."] As contrasted with this, a w... question demands in reference to a certain sentential function the assertion of a closed full sentence (or sentential framework). In a symbolic question, the genus of the arguments requested is determined by the kind of the argument variables. In the word-languages this genus is indicated by means either of a specific w... interrogative (such as 'who', 'where', 'when') or of an unspecific w... interrogative (such as 'what', 'which') with an auxiliary universal word. Hence here also the universal word is, so to speak, an index to a variable.

*Examples:* 1. Suppose I want to ask someone to make an assertion of the form "Charles was — in Berlin", where a time-determination of which I am ignorant but which I wish to learn from the assertion is to take the place of the dash. Now the question must indicate by some means that the missing expression is to be a time-determination. If symbols are used this can be effected by giving a sentential function in which in the place of the argument a variable '$t$', which is established as a temporal variable, occurs. [To symbolize the question, the variable whose argument is requested must be bound by means of a question-operator, e.g. '$(?\,t)$ (Charles was $t$ in Berlin)'.] In the word-language the kind of argument requested is made known either by means of the specific question-word 'when' ("When was Charles in Berlin?") or by means of the universal word 'time' or 'temporal point' attached to an unspecific question-word ("At what time was Charles in Berlin?").

2. I wish to ask someone to make me an assertion of the form "Charles is — of Peter", where a relation-word is to take the place of the dash ('father', 'friend', 'teacher', or the like). The symbolic formulation of this question, by means of the relational variable '$R$', is: '$(?\,R)\,(R\,(\text{Charles, Peter}))$'. Its formulation in the word-language by means of the addition of the universal word 'relation' to an unspecific question-word is: "What relation is there between Charles and Peter?"



## § 77. Universal Words in the Material Mode of Speech

In the first use of the universal word, which we have up to now been discussing, it appears as an auxiliary symbol determining the genus of another expression; it was found that, if in place of this other expression a symbol indicating its own genus was introduced, then the universal word could be dispensed with. As opposed to this, *in the second use the universal word appears as an independent expression*, which in the simplest form occupies the place of the predicate in the sentence in question. Sentences of this kind belong to the *material mode of speech*; for a universal word is here a quasi-syntactical predicate; the correlated syntactical predicate is that which designates the appertaining expressional genus. [*Example:* 'number' is a universal word because it belongs analytically to all the objects of a genus of objects, namely, that of the numbers; the correlated syntactical predicate is 'numerical expression' (or 'number-word'), since this applies to all expressions which designate a number. The sentence "Five is a number" is a quasi-syntactical sentence of the material mode of speech; a correlated syntactical sentence is "'Five' is a number-word".]

| *Sentences with universal words* | *Syntactical sentences* |
|---|---|
| (Material mode of speech) | (Formal mode of speech) |
| 17*a*. The moon is a *thing*; five is not a thing, but a *number*. | 17*b*. 'Moon' is a thing-word (thing-name); 'five' is not a thing-word, but a number-word. |

In 17*a*, as contrasted with sentences like "the thing moon...", "the number five...", the universal words 'thing' and 'number' are independent.

| | |
|---|---|
| 18*a*. A property is not a *thing*. | 18*b*. An adjective (property-word) is not a thing-word. |

That the formulation 18*a* is open to objection is shown by the following consideration. 18*a* violates the ordinary rule of types. This comes out particularly clearly when an attempt is made to formulate it symbolically, either by means of '$(F)\,(\text{Prop}\,(F) \supset \sim \text{Thing}\,(F))$' or by means of '$(x)\,(\text{Prop}\,(x) \supset \sim \text{Thing}\,(x))$'; in the first case, '$\text{Thing}\,(F)$', and in the second case '$\text{Prop}\,(x)$', is inconsistent with the rule of types. Therefore, if 18*a* is admitted as a sentence (it makes no difference whether true or false), by the usual syntax of logistics Russell's antinomy can be constructed. If this is to be avoided, special complicated syntactical rules are necessary.

| | |
|---|---|
| 19*a*. Friendship is a *relation*. | 19*b*. 'Friendship' is a relation-word. |
| 20*a*. Friendship is not a *property*. | 20*b*. 'Friendship' is not a property-word. |

19*a* corresponds to the sentential form used by Russell '... ϵ Rel'; the analogous symbolic formulation of 20*a* would, however, violate the rule of types. On the other hand, the correlated sentences of the formal mode of speech, 19*b* and 20*b*, are, even without any special preliminary adjustments, of the same kind and equally correct. In contrast with the pseudo-object-sentence 19*a*, a sentence of the form "Friendship ensues if...", for instance, is a genuine object-sentence, and therefore not a sentence of the material mode of speech.

It is frequently said that the rule of types (even the simple one) restricts the expressiveness of a language to an inconvenient extent, and that one is often tempted to use formulations which would not be allowed by it. Such formulations, however, are often (like the examples given) only pseudo-object-sentences with universal words. If, in such cases, instead of the object-terms which one would like to, but must not, combine, one uses the correlated syntactical terms, the restrictive effect of the rule of types disappears.

Independent universal words appear very often in philosophical sentences, in the logic of science as well as in traditional philosophy. Most of the examples of philosophical sentences which will be given later belong to the material mode of speech by reason of the employment of independent universal words.

## § 78. Confusion in Philosophy Caused by the Material Mode of Speech

The fact that, in philosophical writings—even in those which are free from metaphysics—obscurities so frequently arise, and that in philosophical discussions people so often find themselves talking at cross purposes, is in large part due to the use of the material instead of the formal mode of speech. The habit of formulating in the material mode of speech causes us, in the first place, to deceive ourselves about the objects of our own investigations: pseudo-object-sentences mislead us into thinking that we are dealing with extra-linguistic objects such as numbers, things, properties, experiences, states of affairs, space, time, and so on; and the fact that, in reality, it is a case of language and its connections (such as



numerical expressions, thing-designations, spatial co-ordinates, etc.) is disguised from us by the material mode of speech. This fact only becomes clear by translation into the formal mode of speech, or, in other words, into syntactical sentences about language and linguistic expressions.

Further, the use of the material mode of speech gives rise to obscurity by employing absolute concepts in place of the syntactical concepts which are relative to language. With regard to every sentence of syntax, and consequently every philosophical sentence that it is desired to interpret as syntactical, the language or kind of language to which it is to be referred must be stated. If the language of reference is not given, the sentence is incomplete and ambiguous. Usually a syntactical sentence is intended to hold in one of the following ways:

1. for all languages;
2. for all languages of a certain kind;
3. for the current language of science (or of a sub-domain of science, such as physics, biology, etc.);
4. for a particular language whose syntactical rules have been stated beforehand;
5. for at least one language of a certain kind;
6. for at least one language in general;
7. for a language (not previously stated) which is proposed as a language of science (or of a sub-domain of science);
8. for a language (not previously stated) whose formulation and investigation is proposed (apart from the question whether it is to serve as a language of science or not).

If the formal syntactical mode of speech is used, then linguistic expressions are being discussed. This makes it quite clear that the language intended must be stated. In the majority of cases, however, even if the language is not expressly named, it will be understood from the context which interpretation (say, of those just given) is intended. The use of the *material mode of speech* leads, on the other hand, to a *disregard of the relativity to language of philosophical sentences*; it is responsible for an *erroneous conception of philosophical sentences as absolute*. It is especially to be noted that the statement of a philosophical thesis sometimes (as in interpretation 7 or 8) represents not an *assertion* but a *suggestion*. Any dispute about the truth or falsehood of such a thesis is quite mistaken,

a mere empty battle of words; we can at most discuss the utility of the proposal, or investigate its consequences. But even in cases where a philosophical thesis presents an assertion, obscurity and useless controversy are liable to arise through the possibility of several interpretations (for instance, 1 to 6). A few examples may serve to make this clear. (For the sake of brevity, we shall formulate these sample theses in a more elementary manner than would be done in an actual discussion.)

| *Philosophical sentences* (Material mode of speech) | *Syntactical sentences* (Formal mode of speech) |
|---|---|
| 21 *a*. *Numbers* are classes of classes of things. | 21 *b*. Numerical expressions are class-expressions of the second level. |
| 22 *a*. *Numbers* belong to a special primitive kind of objects. | 22 *b*. Numerical expressions are expressions of the zero-level. |

Let us assume that a logicist holds thesis 21 *a*, and a formalist thesis 22 *a*. Then between these two there can be endless fruitless discussion as to which of them is right and what numbers actually *are*. The uncertainty disappears as soon as the formal mode of speech is applied. First of all, theses 21 *a* and 22 *a* should be translated into 21 *b* and 22 *b*. But these sentences are not yet complete, because the statement of the language intended is lacking. Various interpretations—such, for instance, as those mentioned previously—are still possible. Interpretation 3 is obviously not intended. Under interpretation 1 both parties would be wrong. Under the minimum interpretation, 6, both would be right, and the controversy would be at an end; for it is possible to construct a language of arithmetic either in such a way that 21 *b* is true or in such a way that 22 *b* is true. Perhaps, however, the two disputants agree that they intend their theses as proposals in the sense of 7, for instance. In that case, the question of truth or falsehood cannot be discussed, but only the question whether this or that form of language is the more appropriate for certain purposes.

| | |
|---|---|
| 23 *a*. Some *relations* belong to the primitive data. | 23 *b*. Some two- (or more-) termed predicates belong to the undefined descriptive primitive symbols. |
| 24 *a*. *Relations* are never primitive data, they depend upon the properties of their members. | 24 *b*. All two- and more-termed predicates are defined on the basis of the one-termed predicates. |

In the case of theses 23 *a* and 24 *a*, discussion is again fruitless and deluded until the disputants pass over to the formal mode of speech and agree as to which of the interpretations 1 to 8 is intended for sentences 23 *b* and 24 *b*.



| | |
|---|---|
| 25 *a*. A *thing* is a complex of sense-data. | 25 *b*. Every sentence in which a thing-designation occurs is equipollent to a class of sentences in which no thing-designations but sense-data designations occur. |
| 26 *a*. A thing is a complex of atoms. | 26 *b*. Every sentence in which a thing-designation occurs is equipollent to a sentence in which space-time co-ordinates and certain descriptive functors (of physics) occur. |

Suppose that a positivist maintains thesis 25 *a*, and a realist thesis 26 *a*. Then an endless dispute will arise over the pseudo-question of what a thing actually is. If we transfer to the formal mode of speech, it is in this case possible to reconcile the two theses, even if they are interpreted in the sense of 3, that is, as assertions about the whole language of science. For the various possibilities of translating a thing-sentence into an equipollent sentence are obviously not incompatible with one another. *The controversy between positivism and realism is an idle dispute about pseudo-theses which owes its origin entirely to the use of the material mode of speech.*

Here again we want to emphasize the fact that it does not follow from the given examples that all sentences of the material mode of speech are necessarily incorrect. But they are usually incomplete. Even this does not prevent their correct use; for in every domain incomplete, abbreviated modes of speech may frequently be employed with profit. But the examples show how important it is in using the material mode of speech, especially in philosophical discussions, to be fully aware of its character, so as to be able to avoid the dangers inherent in it. As soon as, in a discussion, obscurities and doubts of the kind here described arise, it is advisable to translate at least the principal thesis involved in the controversy into the formal mode of speech, and to render it more precise by stating whether it is meant as an assertion or as a suggestion, and to which language it refers. If the exponent of a thesis refuses to make these statements concerning it, the thesis is incomplete and therefore ineligible for discussion.

## § 79. Philosophical Sentences in the Material and in the Formal Mode of Speech

We will now give a series of further examples of sentences in the material mode of speech, together with their translations into the formal mode. These are sentences such as commonly occur in philosophical discussions, sometimes in those of the traditional sort, sometimes in investigations which are already expressly oriented in accordance with the logic of science. [For the sake of brevity, the sentences are, to a certain extent, formulated in a simplified way.] These illustrative sentences (as also those of § 78) have not, for the most part, the simple form of those for which we formulated the criterion of the material mode of speech in an earlier section. But they have the general feature which is characteristic of the material mode of speech; they speak about objects of some kind, but in such a way that it is possible to construct correlated sentences of the formal mode of speech which make corresponding assertions about the designations of these objects. Since the original sentence, in most cases, cannot be understood univocally, a particular translation into the formal mode of speech cannot univocally be given; it cannot even be stated with certainty that the sentence in question is a pseudo-object-sentence and, hence, a sentence of the material mode of speech. The translation given here is accordingly no more than a suggestion and is in no way binding. It is the task of anyone who wishes to maintain the philosophical thesis in question to interpret it by translating it into an exact sentence. This latter may sometimes be a genuine object-sentence (that is to say, not a quasi-syntactical sentence); and, in that case, no material mode of speech occurs. Otherwise it must be possible to give the interpretation by means of translation into a syntactical sentence. The syntactical sentences of the following examples—like those of the preceding ones—must further be completed by stating the language which is referred to; from this statement it can then be seen whether the sentence is an assertion or a proposal, e.g. a new rule. We have omitted these statements in the examples which follow, because as a rule it is impossible to obtain them univocally from the philosophical sentences of the material mode of speech. [Here, as in the earlier



examples, it obviously makes no difference to our investigations whether the illustrative sentences are true or not.]

| *Philosophical sentences* (Material mode of speech) | *Syntactical sentences* (Formal mode of speech) |
|---|---|
| A. *Generalities* (about things, properties, facts, and so on). Here belong also Examples 7, 9, 17–20. | |
| 27*a*. A property of a thing-property is not itself a thing-property. | 27*b*. A $^2\mathfrak{pr}$ is not a $^1\mathfrak{pr}$. |
| 28*a*. A property cannot possess another property. (As opposed to 27*a*.) | 28*b*. There is no $\mathfrak{pr}$ of a level higher than the first. (As opposed to 27*b*.) |
| 29*a*. The world is the totality of facts, not of things. | 29*b*. Science is a system of sentences, not of names. |
| 30*a*. A fact is a combination of objects (entities, things). | 30*b*. A sentence is a series of symbols. |
| 31*a*. If I know an object, then I also know all the possibilities of its occurrence in facts. | 31*b*. If the genus of a symbol is given, then all the possibilities of its occurrence in sentences are also given. |
| 32*a*. Identity is not a relation between objects. | 32*b*. The symbol of identity is not a descriptive symbol. |

Sentences 29*a* to 32*a* come from Wittgenstein. Similarly many other sentences of his which at first appear obscure become clear when translated into the formal mode of speech.

| | |
|---|---|
| 33*a*. This circumstance (or: fact, process, condition) is logically necessary; ...logically impossible (or: inconceivable); ... logically possible (or: conceivable). | 33*b*. This sentence is analytic; ...contradictory; ...not contradictory. |
| 34*a*. This circumstance (or: fact, process, condition) is really (or: physically, in accordance with natural laws) necessary; ... really impossible; ...really possible. | 34*b*. This sentence is valid; ...contravalid; ...not contravalid. |
| 35*a*. The circumstance (or fact, process, condition) $C_1$ is a logically (or really) necessary condition for the circumstance $C_2$. | 35*b*. $\mathfrak{S}_1$ is an L-consequence (or a P-consequence, respectively) of $\mathfrak{S}_2$. |

33*a* to 35*a* are sentences of modality; see § 69.

36*a*. A property of an object c is called an *essential* (or: *internal*) property of c, if it is inconceivable that c should not possess it (or: if c necessarily possesses it); otherwise it is an *inessential* (or: *external*) property. (Correspondingly for a relation.)

36*b*. $\mathfrak{pr}_i$ is called an analytic (or, if desired: an essential or internal) predicate in relation to an object-designation $\mathfrak{A}_i$ if $\mathfrak{pr}_i(\mathfrak{A}_i)$ is analytic. (Correspondingly for a two- or more-termed predicate.)

The uncertainty of the formulation 36*a* is shown by the fact that it leads to obscurities and contradictions. Let us take as the object c, for example, the father of Charles. According to definition 36*a*, being related to Charles is an essential property of c, since it is inconceivable that the father of Charles should not be related to Charles. But being a landowner is not an essential property of the father of Charles. For, even if he is a landowner, it is conceivable that he might not be one. On the other hand, being a landowner is an essential property of the owner of this piece of land. For it is inconceivable that the owner of this piece of land should not be a landowner. Now, however, it happens to be the father of Charles who is the owner of this piece of land. On the basis of definition 36*a*, it has just been proved that it is both an essential and not an essential property of this man to be a landowner. Thus 36*a* leads to a contradiction; but 36*b* does not, because 'landowner' is an analytic predicate in relation to the object-designation 'the owner of this piece of land', but it is not an analytic predicate in relation to the object-designation 'the father of Charles'. Hence the fault of definition 36*a* lies in the fact that it is referred to the one *object* instead of to the *object-designations*, which may be *different* even when the object is the same.

This example shows (as will easily be confirmed by a closer investigation) that the numerous discussions and controversies about *external and internal properties and relations* are idle, if, as is usual, they are based on a definition of either the form indicated or one resembling it, or, at any rate, on one which is formulated in the material mode of speech. [Such investigations are especially to be found in the work of Anglo-Saxon philosophers, and it was through them that Wittgenstein, although it is to him that we owe the detection of many other pseudo-questions, was himself misled into enquiries of this nature.] If instead of the usual sort of definition, a definition in the formal mode is given, then the situation in these commonly disputed cases becomes unambiguous, and moreover so simple that no one can any longer be tempted to raise philosophical problems about it.

B. *The so-called philosophy of number; logical analysis of arithmetic.*

Here belong also Examples 10, 17, 21, and 22.

37*a*. God created the natural numbers (integers); fractions and real numbers, on the other hand, are the work of man. (Kronecker.)

37*b*. The natural-number symbols are primitive symbols; the fractional expressions and the real-number expressions are introduced by definition.

38*a*. The natural numbers are not given; only an initial term of the process of counting and the operation of progression from one term to the next are given; the other terms are created progressively by means of this operation.

38*b*. The natural number expressions are not primitive symbols (as opposed to 37*b*); only '0' and '′' are primitive symbols; an $\mathfrak{St}$ has the form nu or $\mathfrak{St}'$. (Languages I and II.)

39*a*. The mathematical *continuum* is a series of a certain structure; the terms of the series are the *real numbers*.

39*b*. A $\mathfrak{pr}^2_1$, to which certain structural properties (density, continuity, etc.) are attributed in the axioms, is a primitive symbol. The arguments which are suitable to $\mathfrak{pr}_1$—they are expressions of the zero-level—are called real-number expressions.

40*a*. The mathematical continuum is not composed of atomic elements, but is a whole which is analysable into ever further analysable sub-intervals. A real number is a series of intervals contained one inside the other.

40*b*. A $\mathfrak{pr}^2_1$, to which certain structural properties (namely, those of a part-whole relation of a certain kind) are attributed in the axioms, is a primitive symbol. An $\mathfrak{Fu}^1$ whose arguments are natural-number expressions and whose value-expressions are suitable as arguments to $\mathfrak{pr}_1$ is called a real-number expression. [A so-called creative sequence of selections is then represented by an $\mathfrak{Fu}_b$; see p. 148.]

39*a* and 40*a* present (in a simplified formulation) the antithesis between *the usual mathematical conception of the continuum of real numbers, based on the theory of aggregates*, and *the intuitionist conception of the continuum represented by Brouwer and Weyl*, which rejects the former as atomistic. 39*b* and 40*b* may be interpreted as suggestions for the construction of two different calculi.

C. *Problems of the so-called given or primitive data (epistemology, phenomenology); logical analysis of the protocol sentences.*

Here belong also Examples 23 and 24.

41*a*. The only *primitive data* are relations between experiences.

41*b*. Only two- or more-termed predicates whose arguments belong to the genus of the experience-expressions occur as descriptive primitive symbols.

42 *a*. A temporal series of visual fields is given as primitive data; every visual field is a two-dimensional system of positions which are occupied by colours. (As opposed to 41 *a*.)

42 *b*. A descriptive atomic sentence consists of a time co-ordinate, two space co-ordinates and a colour expression.

43 *a*. The sense-qualities, such as colours, smells, etc., belong to the primitive data.

43 *b*. Symbols of sense-qualities, such as colour-symbols, smell-symbols, etc., belong to the descriptive primitive symbols.

44 *a*. The fact that the system of colours arranged according to similarity (the so-called colour-pyramid) is three-dimensional, is known *a priori* (or: is to be apprehended by intuition of essence; or: is an internal property of that arrangement).

44 *b*. A colour-expression consists of three co-ordinates; the values of each co-ordinate form a serial order according to syntactical rules; on the basis of these syntactical rules, therefore, the colour-expressions constitute a three-dimensional order.

45 *a*. The colours are not originally given as members of an order, but as individuals; an empirical relation of similarity exists between them, however, on the basis of which the colours can be arranged empirically in a three-dimensional order.

45 *b*. The colour expressions are not compound; they are primitive symbols; further, a symmetrical, reflexive, but not transitive, $\mathrm{pr}^2_b$ to which the colour-expressions are suitable as arguments, occurs as a primitive symbol; the theorem of the three-dimensionality of the order determined by this pr is P-valid.

The much-disputed philosophical question as to whether the knowledge of the *three-dimensionality of the colour-pyramid* is *a priori* or *empirical* is thus, by reason of the use of the material mode of speech, incomplete. The answer is dependent upon the form of the language.

46 *a*. Every *colour* possesses three components: colour-tone, saturation, and intensity (or: colour-tone, white-content, and black-content).

46 *b*. Every colour-expression consists of three partial expressions (or: is synonymous with an expression composed in this way): one colour-tone expression, one saturation-expression, and one intensity-expression.

47 *a*. Every colour is at a place.

47 *b*. A colour-expression is always accompanied in a sentence by a place-designation.

48 *a*. Every *tone* has a certain pitch.

48 *b*. Every tone-expression contains an expression of pitch.



D. *The so-called natural philosophy; logical analysis of the natural sciences.*

Here belong also Examples 11, 25, and 26.

49 *a*. *Time* is continuous.

49 *b*. The real-number expressions are used as time-co-ordinates.

See Wittgenstein on this point ([*Tractatus*] p. 172): "All propositions such as the law of causation, the law of continuity in nature, . . . are *a priori* intuitions of the possible forms of the propositions of science." (Instead of "*a priori* intuitions of" we would prefer to say: "conventions concerning".)

50 *a*. *Time* is one-dimensional; *space* is three-dimensional.

50 *b*. A time-designation consists of one co-ordinate; a space-designation consists of three co-ordinates.

51 *a*. Time is infinite in both directions, forwards and backwards.

51 *b*. Every positive or negative real-number expression can be used as a time-co-ordinate.

The opposition between the *determinism* of classical physics and the probability determination of quantum physics concerns a syntactical difference in the system of natural laws, that is, of the P-rules of the physical language (already formulated or still to seek); this is shown by the two following examples.

52 *a*. Every process is univocally determined by its causes.

52 *b*. For every particular physical sentence $\mathfrak{S}_1$ there is, for any time-co-ordinate $\mathfrak{A}_1$ which has a smaller value than the time-co-ordinate which occurs in $\mathfrak{S}_1$, a class $\mathfrak{R}_1$ of particular sentences with $\mathfrak{A}_1$ as time-co-ordinate, such that $\mathfrak{S}_1$ is a P-consequence of $\mathfrak{R}_1$.

53 *a*. The position and velocity of a particle is not univocally but only probably determined by a previous constellation of particles.

53 *b*. If $\mathfrak{S}_1$ is a particular sentence concerning particles and $\mathfrak{A}_1$ a time-co-ordinate of smaller value than that which occurs in $\mathfrak{S}_1$, then $\mathfrak{S}_1$ is not a P-consequence of a class of such sentences with $\mathfrak{A}_1$ as time-co-ordinate, however comprehensive, but only a probability-consequence of such a class with a coefficient of probability smaller than 1.

## § 80. The Dangers of the Material Mode of Speech

If we wish to characterize the *material mode of speech* by one general term, we may say, for instance, that it is *a special kind of transposed mode of speech*. By a transposed mode of speech we mean one in which, in order to assert something about an object *a*, something corresponding is asserted about an object *b* which stands in a certain relation to the object *a* (this does not pretend to be an exact definition). For example, every metaphor is a transposed mode of speech; but other kinds also occur frequently in ordinary language —far more frequently than one may at first believe. The use of a transposed mode of speech can easily lead to obscurities; but when systematically carried into effect, it is non-contradictory.

*Examples* of different kinds of *transposed mode of speech*. 1. An artificial example. The term 'marge' (as a term parallel to 'large') is introduced by means of the following rule: if a place has more than 10,000 inhabitants, then we shall say that the place *b*, whose name precedes that of *a* in the alphabetical list of places, is marge. A rule of this kind can be carried into effect without any contradiction; for instance, according to it, the place Berlichingen is marge, since, in the alphabetical list of places, its name is followed by 'Berlin'. The definition seems absurd, since it makes no difference to the properties (in the ordinary sense) of a place whether it is marge or not. But the same thing holds for the ordinary material mode of speech also (see below, Example 5), even (as one finds on examination, in opposition, of course, to the view commonly held) for Examples 2, 3, and 4. 2. According to the ordinary use of language, a man is called *famous* if other people make assertions of a certain kind about him. 3. According to the ordinary use of language, an action *a* of a certain person is called *legal crime* if the penal law of the country in which that person lives places the description of a kind of action to which *a* belongs in the list of crimes. 4. According to the ordinary use of language, an action *a* of a certain person is called a *moral crime* if, in the minds of the majority of other persons, the thought of someone (but not themselves) committing an action of this kind calls forth the feeling of moral indignation. 5. According to the ordinary use of language, it is said of a city (for instance, of Babylon; see the example in § 74) that it has been treated of in a certain lecture (material mode of speech) if a designation of the city has occurred in this lecture. For the qualities (in the ordinary sense) of the city in question, it is not of the least importance whether it has the property of having been treated of in yesterday's lecture or not. This property is therefore a transposed property.



The material mode of speech is a transposed mode of speech. In using it, in order to say something about a word (or a sentence) we say instead something parallel about the object designated by the word (or the fact described by the sentence, respectively). The origin of a transposed mode of speech can sometimes be explained psychologically by the fact that the conception of the substituted object *b* is for some reason more vivid and striking, stronger in feeling-tone, than the conception of the original object *a*. This is the case with the material mode of speech. The image of a word (for instance, of the word 'house') is often much less vivid and lively than that of the object which the word designates (in the example, that of the house). Further, the fact, which is perhaps a consequence of the psychological fact just mentioned, that the approach and method of syntax have hitherto not been sufficiently known, and that, in consequence, the majority of the necessary syntactical terms have not been a part of ordinary language, may have contributed to the origin of the material mode of speech. For this reason, instead of saying: "The sentence '*a* has three books, *b* has two books, and *a* and *b* together have seven books' is contradictory", we say: "It is impossible (or inconceivable) for *a* to have three books, *b* two books, and *a* and *b* together seven books"; or (which has an even stronger resemblance to an object-sentence): "If *a* has three books, and *b* two, then *a* and *b* together cannot possibly have seven books." People are not accustomed to direct their attention to the sentence instead of the fact; and it is apparently much more difficult to do so. In addition, there is the circumstance that, in ordinary language, we have no syntactical expression which is equivalent in meaning to 'contradictory', while the quasi-syntactical expression 'impossible' is ready to hand.

How difficult it is even for scientists to adopt the syntactical point of view, that is to say, to pay attention to the sentences instead of to the facts, is shown especially clearly in the typical misunderstandings which one encounters again and again in discussing logical questions even with scientists, and still more with philosophers. For instance, when we of the Vienna Circle criticize, in accordance with our anti-metaphysical view, certain sentences of metaphysics (such as: "There is a God") or of metaphysical epistemology (such as: "The external world is real") we are interpreted by the majority of our opponents as denying those object-sentences and consequently affirming others (such as: "There is no God" or: "The ex-

ternal world is not real", etc.). These misunderstandings are always occurring in spite of the fact that we have already explained them many times (see, for instance, Carnap [*Scheinprobleme*], Schlick [*Positivismus*], Carnap [*Metaphysik*]), and are constantly pointing out that we are not talking about the (supposititious) facts, but about the (supposititious) sentences; in the mode of expression of this book: the thesis maintained by us is not an object-sentence but a syntactical sentence.

The suggestions we have given are intended only to throw light upon, and not by any means to answer, the question of the psychological explanation of transposed modes of speech in general, and of the material mode in particular. To investigate it more closely would be well worth while; but we must leave that task to the psychologists. What we must here take into account is the fact that the material mode of speech is a part of ordinary linguistic usage, and that it will continue to be frequently employed, even by ourselves. Therefore it behoves us to pay special attention to the dangers connected with its use.

Most of the ordinary formulations in the material mode of speech depend upon the use of universal words. *Universal words very easily lead to pseudo-problems*; they appear to designate kinds of objects, and thus make it natural to ask questions concerning the nature of objects of these kinds. For instance, philosophers from antiquity to the present day have associated with the universal word '*number*' certain pseudo-problems which have led to the most abstruse inquiries and controversies. It has been asked, for example, whether numbers are real or ideal objects, whether they are extra-mental or only exist in the mind, whether they are the creation of thought or independent of it, whether they are potential or actual, whether real or fictitious. The question of the origin of numbers has been raised, and has been found to be due to a division of the self, to an original primitive intuition of duality in unity, and so forth. Similarly, innumerable questions have been put concerning *the nature of space and time*, not only by speculative metaphysicians (up to recent times), but also by many philosophers whose epistemological theses are ostensibly (as with Kant) oriented in accordance with empirical science. As opposed to all this, an inquiry which is free from metaphysics and concerned with the logic of science can only have as its object the syntax of the spatio-temporal expressions of the language of science, in the



form, say, of an axiomatics of the space-time system of physics (as, for instance, the researches of Reichenbach [*Axiomatik*]). Further, mention should be made of the many pseudo-problems concerning the nature of the *physical* and the *psychical*. Again, the pseudo-questions concerning *properties and relations* and with them *the whole controversy about universals* rests on the misleading use of universal words. All pseudo-questions of this kind disappear if the formal instead of the material mode of speech is used, that is, if in the formulation of questions, instead of universal words (such as 'number', 'space', 'universal'), we employ the corresponding syntactical words ('numerical expression', 'space-co-ordinate', 'predicate', etc.).

We have already met with a number of examples in which the use of the material mode of speech leads to contradictions. The danger of the occurrence of such contradictions is especially great in the case of languages which are mutually translatable, or, from the standpoint of one language of science, of two sub-languages between the sentences of which certain relations of equipollence (not necessarily of L-equipollence) hold. This applies, for instance, to *the language of psychology and the language of physics*. If the material mode of speech is employed in relation to the psychological language (by the use, for instance, of universal words like 'the psychical', 'psyche', 'psychical process', 'mental process', 'act', 'experience', 'content of experience', 'intentional object', and so on), and if, in the same investigation, it is also used in relation to the physical language (either the everyday language or the scientific language), hopeless confusion frequently ensues.

The danger here indicated has been described by us in detail on other occasions ([*Phys. Sprache*] pp. 453 ff., [*Unity*]). Compare also [*Psychol.*] p. 186, where attention is drawn to the obscurities which arise from the use of the material mode of speech in the sentences of a psychologist; further, see [*Psychol.*] p. 181 for the origin of a pseudo-problem due to the material mode of speech. The examples on p. 314 under I also belong in part here. On the psycho-physical problem, see p. 324.

From the earlier examples, which could easily be multiplied, it is clear that the use of the material mode of speech often gives rise to an obscurity, an ambiguity, which is manifested, for instance, in the fact that essentially different translations into the formal mode of speech are possible. In more extreme cases, contradic-

tions also appear. These contradictions are, however, frequently not at all obvious, for the reason that the consequences are not derived by means of formal rules, but by means of material considerations, in which it is often possible to avoid the traps that one has set oneself by this dubious formulation. Even where no contradictions or ambiguities occur, the use of the material mode of speech has the disadvantage of leading easily to self-deception as regards the object under discussion: one believes that one is investigating certain objects and facts, whereas one is, in reality, investigating their designations, i.e. words and sentences.

## § 81. The Admissibility of the Material Mode of Speech

We have spoken of dangers and not of errors of the material mode of speech. *The material mode of speech is not in itself erroneous*; it only readily lends itself to wrong use. But if suitable definitions and rules for the material mode of speech are laid down and systematically applied, no obscurities or contradictions arise. Since, however, the word-language is too irregular and too complicated to be actually comprehended in a system of rules, one must guard against the dangers of the material mode of speech as it is ordinarily used in the word-language by keeping in mind the peculiar character of its sentences. Especially when important conclusions or philosophical problems are to be based on sentences of the material mode of speech, it is wise to make sure of their freedom from ambiguity by translating them into the formal mode.

*It is not by any means suggested that the material mode of speech should be entirely eliminated.* For since it is established in general use, and is thus more readily understood, and is, moreover, often shorter and more obvious than the formal mode, *its use is frequently expedient.* Even in this book, and especially in this Part, the material mode of speech has often been employed; here are some examples:

| *Material mode of speech* | *Formal mode of speech* |
|---|---|
| 54*a*. Philosophical questions are sometimes concerned with objects which do not occur in the object-domain of the empirical sciences. For example: the thing-in-itself, the transcendental, and the like (p. 278). | 54*b*. In philosophical questions expressions sometimes occur which do not occur in the languages of the sciences; for example, the expressions: 'thing-in-itself', 'the transcendental', etc. |
| 55*a*. An object-question is concerned, for instance, with the properties of animals; on the other hand, a logical question is concerned with the sentences of zoology (p. 278). | 55*b*. In an object-question, predicates of the language of zoology (designations of kinds of animals) occur; on the other hand, in a logical question, designations of sentences of the zoological language occur. |
| 56*a*. It is just as easy to construct sentences about the forms of linguistic expressions as it is to construct sentences about the geometrical forms of geometrical structures (pp. 282 f.). | 56*b*. It is just as easy to construct sentences in which, as predicates, syntactical predicates occur, and, as arguments, syntactical designations of expressions, as it is to construct sentences in which, as predicates, predicates of the language of (pure) geometry occur, and, as arguments, object-designations of the language of geometry. |



If a sentence of the material mode of speech is given, or, more generally, a sentence which is not a genuine object-sentence, then the translation into the formal mode of speech need not always be undertaken, but it must always be possible. *Translatability into the formal mode of speech constitutes the touchstone for all philosophical sentences*, or, more generally, for all sentences which do not belong to the language of any one of the empirical sciences. In investigating translatability, the ordinary use of language and the definitions which may have been given by the author must be taken into consideration. In order to find a translation, we attempt to use, wherever a universal word occurs (such as 'number' or 'property') the corresponding syntactical expression (such as 'numerical expression' or 'property-word', respectively). Sentences which do not, at least to a certain extent, univocally determine their translation are thereby shown to be ambiguous and obscure. Sentences which do not give even a slight indication to determine their translation are outside the realm of the language of science and therefore incapable of discussion, no matter what depths or heights of feeling they may stir. Let us give a few warning examples of such sentences as they occur in the writings of our own circle or in those of closely allied authors. The majority of readers